

# LIFE

## THE WARREN REPORT

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HOW THE  
COMMISSION  
PIECED TOGETHER  
THE EVIDENCE

*Told by One  
of Its Members*



OCTOBER 2 • 1964 • 25¢

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LIFE

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## C. D. Jackson

### 1902-1964

The sextet, dressed in maroon choir robes, quietly took its position behind the bank of flowers in the fine old Presbyterian church and sang *Jesu, Joy of Man's Desiring* by Johann Sebastian Bach. It is a beautiful work, deep yet rippling, like a glacial lake, gay yet resounding with serious intent. It was a favorite of the man in whose memory it was sung that Tuesday afternoon. He was C.D. Jackson, Senior Vice President of Time Incorporated, who, at the age of 62, died on Sept. 18.

The music was an eloquent reflection of C.D., who himself was a man of eloquence. He was a warm friend. Now, as one begins to realize he's no longer here, one suddenly misses his culture, his wisdom and wit and the unforgettable sound of his laughter echoing down a hallway. C.D. served in many capacities during his 33 years at Time Inc. But at LIFE, we feel very specially about him. He was this magazine's first General Manager, and in those early years was a notable influence in charting its course. Then, in 1960, he returned to LIFE as its Publisher.

In C.D. we got not only a publisher but a man of parts who irrepressibly kept plunging on to fulfill the ideas that flowed out of him. "Great ideas," he used to say, "need landing wheels as well as wings." Before the war he was an interventionist, so he helped organize the Council for Democracy to fight isolationism. During the war he served in North Africa and then London as Deputy Chief of the Allied psychological warfare effort. Later he was president of the Free Europe Committee (Radio Free Europe). In 1952 he was strategist and speechwriter for the Eisenhower campaign, and spent more than a year after that as the President's special assistant. Among many other things he was a director or trustee of the Metropolitan Opera, the Boston Symphony, Project HOPE, the Lincoln Center for the Performing Arts and the United Negro College Fund.

C.D. roamed the world and talked with its leaders. His perceptive and often humorous reports are now collectors' items. One told of having a whisky with Britain's Harold Macmillan while the latter treated him to a hilarious two-part skit—in French—re-enacting both sides of a Macmillan-De Gaulle discussion of the Common Market. Another story described a transpacific flight during which he sat next to John Foster Dulles. The two had been discussing international politics when Dulles lapsed into sudden silence, staring at the floor. Many minutes later the Secretary of State cleared his throat and C.D. bent forward to hear the pronouncement. "C.D.," said Dulles enviously, "where did you get those shoes?"

Now, on the tables and leather chairs in his study, there are hundreds of telegrams and letters of condolence addressed to his wife Gracie. They come from all over the world. One in particular has a consoling thought. "I am so thankful that I knew his gay spirit. . . . The day will come when you will feel rich in having had him rather than poor in having lost him."



AS LIFE'S PUBLISHER

*George P. Hunt*  
GEORGE P. HUNT  
Managing Editor



# The Foreign Policy Issue of THIS Year

**E**arlier this year it seemed that the 1964 presidential election might turn mainly on U.S. foreign policy, especially since Johnson had brought so little experience to that side of his job. And with a frustrating hot war in Vietnam, with Castro still in power, with our alliances changing shape and the Cold War changing content, foreign issues do indeed give Americans plenty to think and worry about. But the campaign so far has shed little light on them. The Johnson strategy is to label Goldwater a trigger-happy warmonger. The Goldwater strategy is to label Johnson's "a crisis-of-the-week" foreign policy that lets Communism spread and freedom go down the drain. Both strategies obscure the facts of our situation and the real options open to us abroad.

How much trouble are we actually in? Let's take 1952 as a bench mark. In that year we also had a hot war, a cold war and alliance problems on our hands. Eisenhower was elected, the first Republican in a generation, in good part because the Korean war was stalemated and Communism was still a growing and misunderstood menace.

The main roadblock to Communism then, as now, was U.S. power and purpose. These had already been sufficiently mustered to keep Greece and Turkey alive with the Truman Doctrine and to rearm Europe with NATO. Eisenhower and Dulles hardened this "containment" policy with a global network of commitments and the innovation of stable, long-pull preparedness. These have not been fundamentally altered since. We have remained more than a military match for Communism, and every showdown that tested this—in the Formosa Strait, in Berlin, and more recently in Cuba—has forced a Communist retreat.

**H**ad we sought more showdowns, as Barry Goldwater implies that he would have, there might well have been more Communist retreats. But our moderation in the show of force has also borne its fruit. Some of Khrushchev's main setbacks—the Sino-Soviet split, his chronic farm failure—are not our doing. And we are far from having "won" the Cold War. But, although Goldwater tries to make it sound the same, it is not the same Cold War we faced in '52. It is more complex and less dangerous.

One big change in it, too easily forgotten, took place in Ike's administration. He and Dulles contested and deflated Khrushchev's most potent propaganda weapon: the phony Communist patent on the word "peace." Nuclear weapons made this the most important political word in the world to millions of people. To rescue it from its Communist captivity was a considerable achievement. Eisenhower and Dulles did it by probing for areas of partial agreement with Communism and by imaginative plans on disarmament, such as open-skies inspection. They kept the peace not only through arms and the willingness to use them,

but through negotiation, patience and the willingness to talk.

So have Kennedy and Johnson. Twelve years of experience have now nurtured an American Cold War policy of strength plus negotiation that must be called, in the main, both bipartisan and successful. Since the Cuba showdown, this policy has led to a partial détente with Moscow. Johnson's experts do not pretend to know whether this détente is "a watershed in human history"—leading gradually out of the Cold War—or "a parenthesis between two Communist offensives." In any case the U.S. is ready for either eventuality—a lot readier, it would seem, than the Communists. When Dean Rusk says he would rather have his problems than Khrushchev's, he's right.

Rusk's problems are nevertheless grave enough, and some of them rightly get involved in the current campaign. The Vietnam crisis has not been helped by Johnson's attempts to keep it on ice until after election. Yet Goldwater's swipes at the Vietnam issue have not included a rational alternative to the Administration policy. On Cuba, Goldwater does have coherent and specific policy proposals, including the recognition of a Cuban government-in-exile plus air and matériel support for any invasion it might launch against Castro. However, the increasing diplomatic isolation of Castro has made this risk seem less worth taking. On NATO, which has deteriorated through a combination of De Gaulle, détente and U.S. neglect, Goldwater's insistence that it be rebuilt makes general good sense.

On several specific problems, such as Panama, Germany, Brazil and Chile, Johnson's foreign policy has been lucky or skillful enough to remove them from the political target zone. Meanwhile Goldwater, instead of concentrating on vulnerable points, or advocating fresh programs that could attract knowledgeable support, has resorted to wholesale and inaccurate vituperation. His wild words for Johnson's foreign policy are "decay and ruin . . . disaster and oblivion." This line of attack renders the whole issue unrecognizable to responsible voters.

**G**oldwater has had a good command of the logic of peace through strength and the folly of appeasement, a logic in which some Democrats have often needed a lesson. But his opponent now is Johnson, who needs no such lesson, and the year is 1964, not 1952. To rant at Johnson as though he were an appeaser, or as though America still needed a Paul Revere on Communism, is to be anachronistic. Moreover, if Goldwater can squint so skeptically toward the Sino-Soviet split, which is one of the great political realities of this era, he would surely prove blind to subtler opportunities to weaken Communism by diplomacy. Whence then would come his "victory"?

The Eisenhower-Dulles foreign policy which Goldwater professes to admire was not just "brinkmanship"; it involved a good deal of patience and even of the summitry he has no stomach for. When Khrushchev came here as Eisenhower's guest in '59, the obvious risks in the gesture drew the same apprehensions of appeasement that Goldwater now expresses about détente. Said Vice President Nixon then: "The Communists are not so smart and we are not so dumb" that we need fear contact with them.

Still less need we fear it today when their relative power and menace have not grown but receded. The real foreign policy issue before us is how best to use this pause—or new phase—in the Cold War.

Johnson himself has shown no particular style or dish in foreign affairs, and has none of Kennedy's appetite for the details of policy. Johnson has not yet offered any very invigorating or inspiring vision of the American role in the world. But he has shown prudence and competence and his general picture of the world seems much closer to current reality than Goldwater's, which is out of date and streaked with Walter Mitty oversimplifications. There are a number of issues in this election. Foreign policy, which earlier might have seemed a Johnson weak point, has turned out to be one of his principal strengths.



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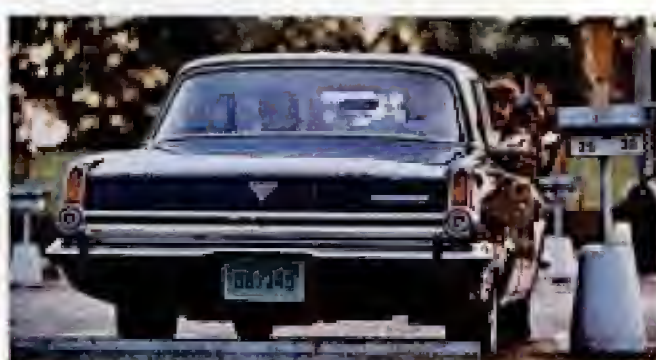
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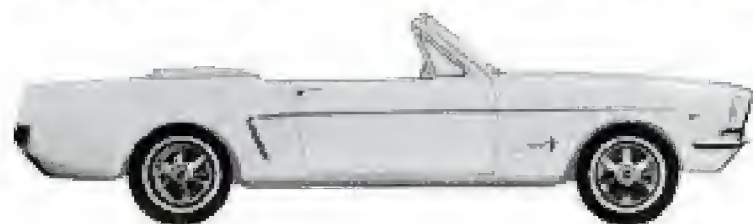
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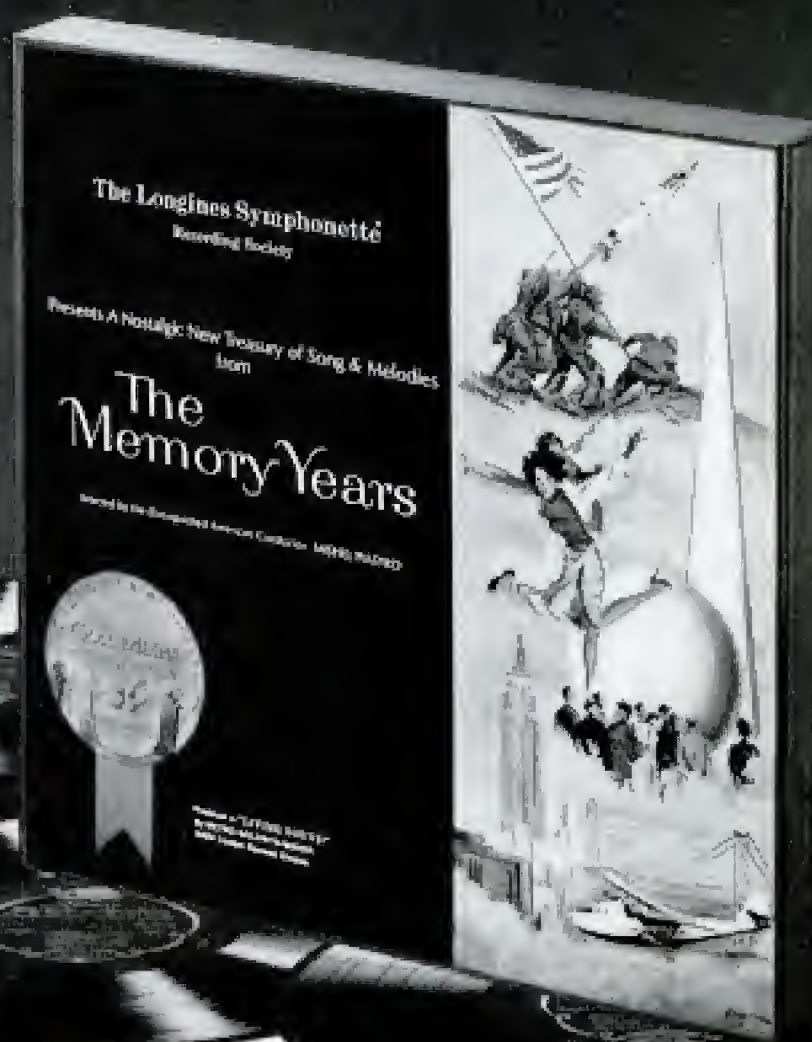
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Moon of Manakona  
I'll Never Smile Again  
That Old Black Magic  
The Boy Next Door  
The Girl That I Marry  
Ebb Tide  
C'est Si Bon  
High Noon*

*Poor People Of Paris  
Love Is A Many Splendored Thing  
My Blue Heaven  
You Were Meant For Me  
Temptation  
Red Sails In The Sunset  
Thanks For The Memory  
Cheek To Cheek  
White Cliffs of Dover  
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Loveliest Night of The Year  
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# Forgotten road to success in writing

One of America's highest paid free-lance authors tells of opportunities often overlooked by people who want to write

By J. D. Ratcliff

I can't understand why more beginners don't take the short road to publication — by writing articles for magazines and newspapers.

Last year over 250,000 articles were bought by general magazines alone. And that's only part\* of a huge market that will pay well for interesting pieces of almost any length on just about any subject that comes naturally to you.

I've earned a comfortable living for 25 years writing articles, and I've enjoyed every minute of it.

## A wonderful life

I've interviewed a dozen winners of Nobel Prizes — among them Sir Alexander Fleming who discovered penicillin. I've talked with heads of state including at least one king, and with scores of the world's leading industrialists. In the past year, I covered stories from Bangkok to Basel to Buffalo.

It's a wonderful life. No commuter trains to catch, no office routine. Whether I'm abroad on assignment, at home on the Jersey Palisades or at our summer place off Cape Cod, I write from 8 a.m. to noon every day — no more, no less. My afternoons are my own.

## How to pick subjects that sell

A big advantage of article writing is that you can break in with material right out of your own everyday experience. One of the first pieces I sold was about the adventures of a test pilot I knew. Another told the story of a friend of mine who was caught in a balloon that ran wild. Look at the table of contents of any general magazine; chances are you'll find several articles you yourself might have written.

You can make good use of your special interests too. One of mine is science, and it's provided dozens of story ideas — from eye-witness accounts of dramatic new heart operations, to a report on some amateurs in Berlin who built an astronomical observatory out of salvaged junk. Your passion may be insurance or religion or football, raising roses or raising children. Whatever it is, you should be able to draw on it for articles that could inform and entertain thousands of readers.

Knowing *what* to write is about half the battle. The other half is knowing *how*. To produce saleable articles, or any other form of writing, you must master the tools and techniques used by successful professional writers.

You might develop these skills on your own through sheer blood, sweat and rejection slips. But when I look back, I can't help thinking of all the time and agony I would have saved if I could have found a real "pro" who was willing to work with me.

Today, such help is available to beginning writers everywhere through the Famous Writers School —

founded three years ago by Rod Serling, Faith Baldwin, Bruce Catton, Bennett Cerf, Max Shulman, Mignon G. Eberhart, Bergen Evans, Red Smith, John Caples, Rudolf Flesch, Mark Wiseman and myself.

## A new kind of writing school

We poured all our secrets of success into a set of specially created textbooks and writing assignments. Then we worked out a method for bringing to each student, in his own home, the many hours of individual instruction a developing writer needs.

When you send an assignment to the School, one of our instructors — themselves all professional writers — spends up to two hours analyzing your work. He blue-pencils corrections on your manuscript, much as an editor does with established authors. And he returns it with a long letter of specific recommendations on how to improve your writing.

Your course begins with the fundamentals upon which every writing career must be built. Then you get concentrated training in writing articles and other non-fiction. (If you prefer, you may specialize in Fiction, Advertising or Business Writing.)

## Students breaking into print

Our School is young. Yet students, most of them still in training, have already sold their work to more than 60 different publications, including *Reader's Digest*, *Redbook*, *Parents'*, *Popular Science*.

"I've just sold an article to *True* for \$1,000," reports insurance agent Alfred E. Gaumer. "This is the first thing I've had published in over 20 years of trying, and I owe it all to your training."

"I've done it!" writes housewife Lillian Maas, after having her first article bought by *Better Homes & Gardens*. "I feel as if I'd joined a club composed of the most vital and literate individuals in the country. How my horizons widened! It's amazing how all of us with a common interest reach out to each other."

Beyond the thrill of receiving that first check, our students find great intangible rewards in writing for publication. As my colleague Faith Baldwin puts it: "If one sentence you write opens a door for another human being — makes him see with your eyes and understand with your mind and heart, you'll gain a sense of fulfillment no other work can bring you."

## Writing Aptitude Test offered

J. D. Ratcliff and the other Famous Writers have designed a revealing Aptitude Test. The coupon will bring you a copy, plus a 48-page brochure about the School. When you return the Test, it will be graded without charge by a member of our instructional staff. If you do well on the Test — or offer other evidence of writing aptitude — you may enroll for professional training by the School. You are, however, under absolutely no obligation to do so.



"Jack" Ratcliff on a typical afternoon stroll through the New Jersey woods, where he conceives many of the articles that prompted a leading magazine to name him "America's No. 1 craftsman in the field of non-fiction." Although he writes no more than four hours a day, he has had over 500 articles published in the *Reader's Digest*, and hundreds more in such magazines as *McCall's*, *The Saturday Evening Post* and *Time*. Among his books are *Lives and Dollars* and *Birth*.

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# LETTERS TO THE EDITORS

## SPECIAL ISSUE: JAPAN

Sirs:

Never have I seen a complicated subject so near to my heart done with such sympathy, clarity and precision as your Japan issue (Sept. 11). Your increasing preoccupation with the great problems of our time stands as a challenge to the sordid commercialism of most of our current news media. My congratulations to all concerned.

GARRY HUGH III  
Longmeadow, Mass.

Sirs:

An issue on Japan? If you had a boy in the service killed in the war you wouldn't want this magazine in your home.

MRS. THELMA POKATCH  
New York, N.Y.

Sirs:

Thank you very much for your beautiful special issue, "Japan," my country, with its beautiful pictures and deep, understanding articles. However I most strongly wish you had found more Japanese bad habits.

Personally I am ashamed of myself. Why? Because I realize that we younger generation have completely ignored our culture and have ignored our long history which brought us today's prosperity. Reading your articles I realized and am ashamed of myself.

I am studying at college in the United States. Your issue opened my mind and gave me a chance to look at my native country from outside, far away from home. Thank you again.

HATSUMI NAKAYAMA  
Grandville, Mich.

Sirs:

As one who was bewitched by Japan, I am most grateful to you for your very fine coverage of the country. One does not readily forget a sunset on Mt. Fuji or an autumn stroll through the tranquil paths of Nikko.

WAYNE G. ENGLE  
Scarsdale, N.Y.

## MODERN JAPAN

Sirs:

Most particularly thrilling were the pictures by Mr. Brian Brake of how Japan looks today. The depth and feeling and technical excellency of these beautiful photographs were almost beyond description. Particularly striking were the Mt. Fuji and bathers shot, and also the one of the youths hunting a lucky stick. They were masterpieces.

JAMES R. TRULOCK  
Corinth, Miss.

## HER COURSE IS SET

Sirs:

Japan is a paradox as the Koestler article says, but a Westerner can get at least a hold-on grip if he understands something of the religious traditions. Consider the puzzling treatment of the individual. The Buddhist stress on compassion and face-to-face relations has given the individual a dignity and a value unmatched by any other Eastern culture. But for the Japanese the individual about whom he is concerned is always someone directly connected with him—a scholar in his field, a member of his family or his best friend's child. Man in general or the meaning of neighbor in a Christian sense has little or no claim on him. Our Kyoto friends are critical about civil rights in the U.S., but when asked blunt questions about the treatment of Koreans in Japan, they showed only a mild concern, if indeed a response. Compassion is for the members of one's particular in-group; it is not supposed to produce an agonized conscience over social justice for people everywhere.

JOHN D. EUSDEN, Chaplain  
Williams College,  
Williamstown, Mass.

Sirs:

Mr. Koestler is mistaken when he implies that the Soka Gakkai is tending toward Nazism. The Soka Gakkai is a religious organization following the philosophy of Nichiren Shoshu Buddhism. It is not a political organization and is connected with politics only by the fact that some Soka Gakkai members have started a political party called the Koseiren. It is the Koseiren which is the third party in the Upper House. There are chapters of the Soka Gakkai in this country and I am a member of one.

BARBARA NEWCOMB  
New York, N.Y.

► Soka Gakkai, an intolerant and authoritarian religious-political group with worldwide ambitions, openly supports the Koseiren as its political arm in Japan. But in overseas chapters Soka Gakkai concentrates on spiritual matters, omits political discussions.—ED.

Sirs:

It is naive for Mr. Koestler to think that those in power in the Soka Gakkai are going to let that organization "be forgotten" in five years or so!

I wonder what the U.S. is going to do when Japan rearms and decides to give other countries (say the Philip-

pines) the benefits of this new religion? Outwardly Japan now looks different but the essential character of the Japanese is still the same.

MRS. J. M. FISKE  
Thousand Oaks, Calif.

## PAST PRESERVED

Sirs:

One thing troubles me very much among Japan's splendidly preserved memorials of the past. In Hiroshima I was impressed with the Memorial Cenotaph and Atomic Dome and the magnificent Peace Bridge. The Peace Memorial Museum, however, was a wholesale display of the remnants of the atomic attack. It vividly displayed the results of the bomb, but I failed to see anything to show why it was dropped on the city. I observed the thousands of Japanese tourists who apparently visit the museum daily. I couldn't help but wonder what percentage of this group might be illiterate, and what they thought and felt of this display as a result of the bombing by the victors upon the vanquished.

I believe museums of this type can only create further hate and distrust—not brotherhood and understanding.

A. WIDEMAN  
Kingston, Pa.

Sirs:

Apropos the photograph of the woman's watch that stopped as the bomb fell on Hiroshima, you say the "missing hour hand, indicated by rust, has been painted in red." But if the time is correctly stated as "16 minutes after 8" the Japanese must use long hands to indicate the hour and short hands to indicate the minutes on their timepieces.

JOHN H. SCHAEFER  
Los Angeles, Calif.

► The end of the longer minute hand was broken off, probably by the blast.—ED.

Sirs:

I couldn't help but think that they should now search diligently for a watch that would just as surely establish the sneak at Pearl Harbor, without which there would have been no Hiroshima. The number of our dead can be obtained from the Department of Navy.

COL. ALFRED B. JAYNES, AUS (ret.)  
Tryon, N.C.

## JUDGING THE U.S.

Sirs:

I reject Yukio Mishima's judgment of the U.S. and unfavorable compari-

son of our sexual moralities with Japan's. Having spent some time in Japan, I was overjoyed to return to the land of the Puritans. What Mishima calls Japan's "lack of prejudices on [sex]" and "rejection of most traditional morality" amounts to the fact that, in a very practical way, they have relegated sex to the level of a commodity. There are many things to learn from Japan, but sexual morality is not one of them.

ROGER MINASSIAN  
Silver Spring, Md.

Sirs:

The article by Yukio Mishima discussing the similarities and differences between the Japanese and the Americans was very enlightening. Understanding these, with emphasis on the similarities, could be essential for future world peace.

JOAN ROOD  
Kalamazoo, Mich.

## MATSUSHITA

Sirs:

It seems to me that you have proven beyond a shadow of a doubt, in your story on businessman Matsushita, that one can be successful while still remaining a humanitarian who thinks about the welfare of his employees and their happiness—instead of himself alone. I think he is a great person and a model employer.

JAMES PAUL FURER  
Van Nuys, Calif.

Sirs:

After reading the article "Meet Mr. Matsushita" I could not help thinking of the novel *Brave New World* by Aldous Huxley. Mr. Matsushita seems quite intent on quickly bringing out the prophecy of a regimented society of pampered children completely dependent on their father-god.

WILLIAM C. WINDLKEN  
Detroit, Mich.

## THE GIRLS

Sirs:

In his good article "The Girls" (in Japan), Mr. Prideaux fails to give due credit to the Origh Girl, one of whom is assigned to each touring bus. Her only, but most important and responsible function, is to alight from the bus and direct the driver when he has to back up, by repeated exclamations of "Origh." Americans will, of course, find in "Origh" a logical linguistic adaption of "all right."

SEGFRED H. MUELLER  
Garden City, N.Y.

## IN LIFE NEXT WEEK

A famous scientist who backed the discredited cancer drug, Krebiozen.

### THE STRANGE CASE OF DR. IVY

### How Lyndon Johnson Runs the Presidency

Political historian James MacGregor Burns sums up the first 10 months

### Spanish Flair in U.S. Fashions

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# FORD MOTOR COMPANY ANNOUNCES AN ENTIRELY NEW MERCURY FOR 1965...NOW IN THE LINCOLN CONTINENTAL TRADITION

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The Lincoln  
Continental tradition  
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see, feel, or touch in  
the 1965 Mercury.

For 1965, Mercury becomes a remarkably different automobile.

As you will see on the next two pages, this car is not a "face lift." Nor an ordinary "change-over." It's an entirely new Mercury.

Introductions of automobiles this new don't happen very often. But Ford Motor Company is proud to have brought you a number of them. The Thunderbird, for example. The Lincoln Continental. And, most recently, the Mustang.

## NEW CONCEPT

Our concept for the 1965 Mercury is new and very simple. It's this. That many more car buyers now want a car that is just a step away in luxury from the high-price field, rather than a small step up from the low-price field.

With this in mind, we asked our Lincoln-Mercury Division to draw heavily on its experience with the Lincoln Continental.

The result is a truly magnificent Mercury. In every important respect, it accurately reflects the Lincoln Continental tradition, the Lincoln Continental way of doing things.

## NEW, FINER VALUES

As you can see on the following pages, the 1965 Mercury is beautifully balanced and proportioned. Sleek and graceful. Notice the long, low thrust of the hood, the full-width grille, the unique pillar lights on the front fenders.

Mercury now rides on a longer wheelbase, has a wider stance. And the ride is steady, solid, supremely quiet. The reserve power at your command makes driving almost effortless.

Inside, all is luxury, yet it's understated. And there's an extensive selection of optional equipment for personal customizing—luxury features once reserved only for the most expensive cars. In every detail, Mercury has been inspired by the Lincoln Continental tradition.

We feel confident that you will like Mercury's new personality. And its new set of finer values. For no medium-price car has ever come so close in luxury to the high-price class.

PLEASE TURN PAGE



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This is Mercury for 1965  
...now in the  
Lincoln Continental tradition

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MERCURY: CHOSEN BY THE DEL MONTE LODGE, PEBBLE BEACH, CALIF., (SHOWN HERE) AS THEIR COURTESY CAR FOR SPECIAL GUESTS

We predict that the reaction of many people when they first see a 1965 Mercury drive by will be: "What car is that?" Mercury is *that* new. The look is new. Completely. Low, sleek, beautifully proportioned. (Notice the long, low proportions of the hood, the full-width grille, the unique pillar lights on the front fenders.) The wheelbase is new . . . 123 inches long. The ride is new. It's smoother, solidier, quieter. Inside, outside—this is an entirely new Mercury. The idea behind all this newness is to bring you the finest, most

luxurious, best-riding car in its field . . . a Mercury that accurately reflects all the excellence of the Lincoln Continental tradition. It's a completely new departure for a medium-price car. We invite you to see how well the idea works—at your Mercury dealer's.



*Mercury*

Ride Walt Disney's Magic Skyway at the Ford Motor Company Wonder Rotunda, New York World's Fair

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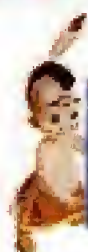
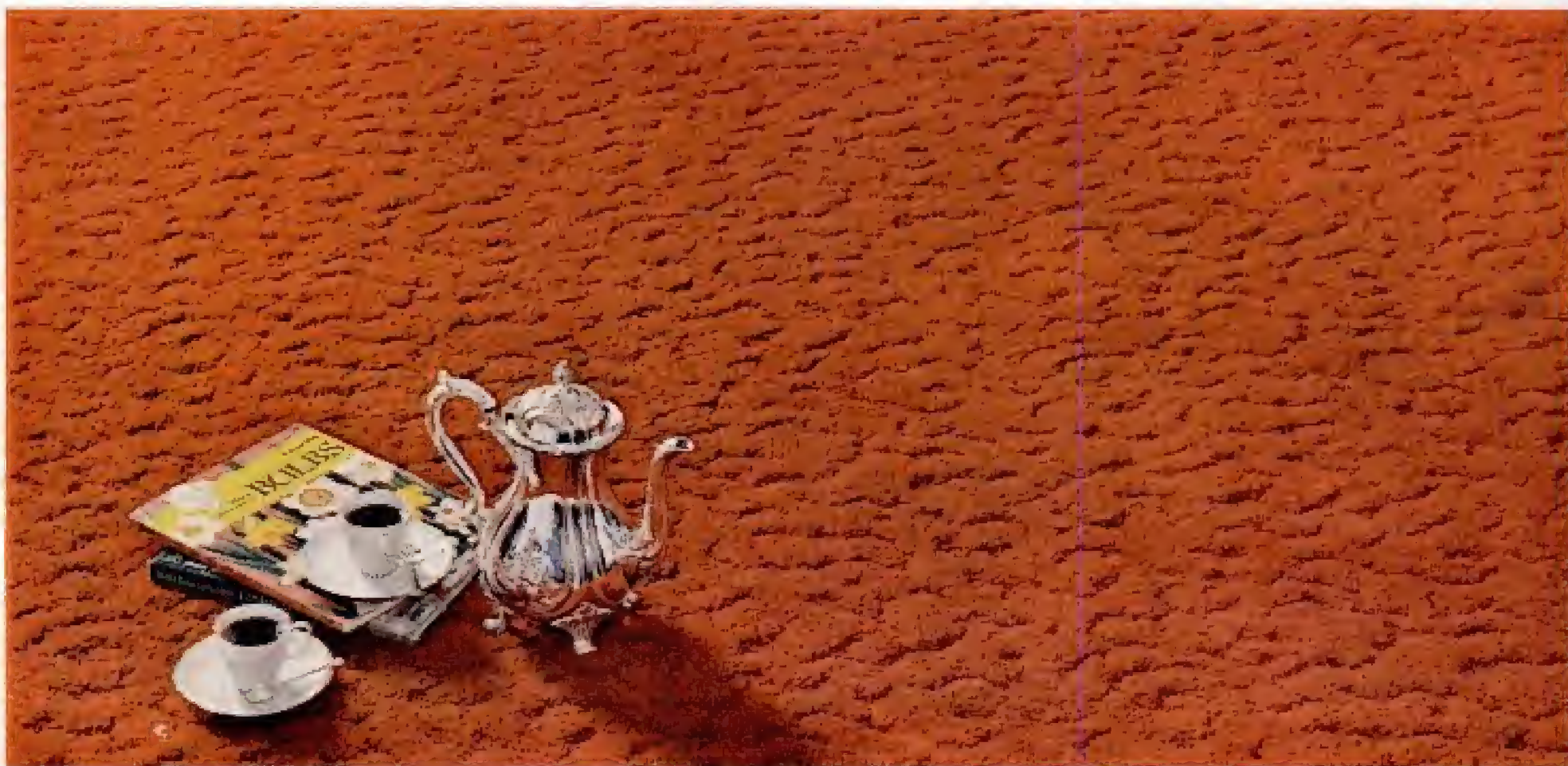
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An exaggeration? Not at all! Carter Grove by Mohawk is made to take such hard wear it *could* be used on your outdoor patio... but should be used in any room in your home where you need carpet that's virtually family proof, yet easy to care for. Its texture and feel

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# Mohawk

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itching and  
scaling  
that  
cause  
the...

# HEARTBREAK of PSORIASIS

IT'S A HEARTBREAK when you have psoriasis and do nothing about those first signs of crusty patches of scaly skin. Heartbreaking, too, when psoriasis leaves your skin rough and scaly and when medications fail to bring the relief you want.

## New fast-acting formula works 3 ways to relieve these symptoms of PSORIASIS

**Guarantees relief or your money back.** Today, for the first time, comes the promise of new relief for millions who suffer the heartbreak of the itching and scaling of psoriasis. It's a new formula called TEGRIN.<sup>®</sup>

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TEGRIN is a fast-acting cream that is so safe you need no prescription. It's pleasant, easy to use—no lingering medical smell or stain. And it's extra effective because it works three ways:

1. **Special soothing action** speeds relief of that persistent and tormenting itch.
2. **Special de-scaling action** works fast to remove embarrassing scales, without harmful skin irritation.
3. **Helps control recurrence** of new scales with continued use on the affected areas.

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Tests prove TEGRIN's unique triple-action formula is so effective—brings such pronounced clearing in so many cases—that we make this guarantee: TEGRIN will leave your skin cleaner, clearer, smoother or we will refund every penny you paid. So why suffer from the itching and scaling that cause the heartbreak of psoriasis? Whenever these symptoms appear, get new TEGRIN!

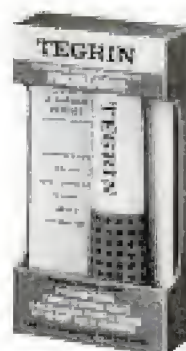


### PSORIASIS SYMPTOMS— 13 common trouble spots:

- |               |               |             |
|---------------|---------------|-------------|
| (1) scalp     | (5) arms      | (10) knees  |
| (2) neck      | (6) hands     | (11) thighs |
| (3) shoulders | (7) chest     | (12) legs   |
| (4) elbows    | (8) back      | (13) feet   |
|               | (9) mid areas |             |

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**LIFE** BOOK REVIEW

## A Tantalizing Look behind Chaplin's Mask

MY AUTOBIOGRAPHY

by CHARLES CHAPLIN (Simon & Schuster) \$6.95

Each of us carries his own image of Charlie Chaplin stamped upon the memory. That image may vary sharply from person to person, depending upon what films were seen, and when, or what newspaper stories were read and which believed. Few other public figures have been so openly adored as Chaplin in his early film career, and few have aroused such bitter hostility as he did in later years. His life needs an answer to the traditional question: "I wonder what he's really like."

The long-awaited *My Autobiography* by Charles Chaplin is that rare occasion: a legend examining itself. After more than a decade of discreet silence, he attempts to explain the human being behind the little tramp and the tired, white-haired man who fled this country with his young wife and small children after a highly publicized paternity suit and wide accusations of subversive political beliefs.

The attempt succeeds best in Chaplin's account of his childhood, a harrowing narrative straight from the pages of Charles Dickens. As the child speaks for the man, we begin to uncover the origins of Chaplin's much-discussed attitudes toward money, material security and social injustice. Without apology and without self-pity, this account of personal deprivation ("Like a fugitive," he recalls, "I kept out of everyone's way") holds the reader's total attention. Beyond the sometimes stilted words of a self-educated man we see the elfin smile and the puzzled eyes of the little tramp. We can also sense how his early deprivations created a withdrawn and suspicious nature in the mature Chaplin—a reticence which mars the later chapters of this curiously unsatisfactory book.

Charles Chaplin was born seventy-five years ago, the younger son of a London music hall soubrette whose voice failed her, whose husband deserted her and whose two young sons followed her into a workhouse before they were separated and sent to an orphanage. In time, the mother drifted into insanity and the sons found refuge in the theater. Shabby back rooms in London tenement houses

gave way to crowded backstage quarters, where a little make-up and more than a little ambition submerged the humiliations of childhood: "No longer was I a nondescript of the slums; now I was a personage of the theater."

And what a personage he became! Brought to the United States in a comedy troupe before the First World War, Chaplin ventured tentatively into motion pictures. In a sudden, inspired improvisation ("... the moment I was dressed, the clothes and the make-up made me feel the person he was. I began to know him, and by the time I walked onto the stage he was fully born"), he created the tramp with the little bowler hat and the big black shoes, which made him the world's darling.

The war came, and then the star-studded '20s, and then the Depression, and then another war, and Charlie continued through it all, a mute anachronism befriending blind flower girls, struggling hopelessly with factory machines and impersonating hysterical dictators.

But success, unlike childhood pain, is difficult to convey. Here and there—more often in the later pages of *My Autobiography*—a glamorous name hobbles upon the surface of a dispirited narrative: Rudolph Valentino, Pola Negri, Mabel Normand, Mack Sennett, Marion Davies and, in Chaplin's most appealing anecdotes, W. R. Hearst—but they fade away in the details of a life once lived passionately but remembered only with a remote, indifferent discretion. Only one friend—Douglas Fairbanks—emerges, while Mary Pickford becomes the center of an anecdote in which the penniless little tramp and America's Sweetheart squabble about who gets what from the sale of the United Artists film company. Unable or unwilling to write a record of his inner life, Chaplin turns to the honors he received, the cheering crowds that greeted him on his travels, and the parties he attended.

His personal life, too, is treated with a perfunctory reticence. Passing quickly by his two early marriages,

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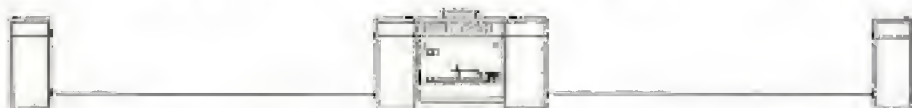




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## REVIEW CONTINUED

he lingers ambiguously over his union with Paulette Goddard but finally pays a deeply felt tribute to his young wife, Oona O'Neill: "As I live with Oona, the depth and beauty of her character are a constant revelation to me. Even as she walks ahead of me along the narrow sidewalks of Yevy with simple dignity . . . a sudden wave of love and admiration comes over me for all that she is—and a lump comes into my throat."

The lump too seldom comes into

the reader's throat. In spite of insanity, poverty and desperate loneliness in the early sections, we are never moved to tears. Even with the memory of Mabel Normand, Mack Sennett and Fatty Arbuckle, we are seldom moved to smiles. They, along with the legend who is telling the story with his, escape us. We leave the book as we approached it: with our own personal image of Charlie Chaplin—and no other—stamped indelibly upon a mental retina.

*by Harding Lemay*

## LIFE MOVIE REVIEW

### A Touching, Tortured Lilith

LILITH

with Jean Seberg and Warren Beatty

According to Hebrew mythology, Lilith was either Adam's first wife, a virago who was kicked out of Eden, or else a night hag who tempted men and killed newborn babies. In any case she was a thoroughly bad girl. In Robert Rossen's new film, *Lilith* is a lovely, amiable creature, whose seemingly gentle nature masks a tortured spirit and a chilling instinct for evil. Lilith is a schizophrenic, confined to a chic, beautifully landscaped private asylum after her brother committed suicide because she had tempted him to an incestuous desire for her. She and the other inhabitants share three traits: above average wealth, uncommon intelligence and madness.

In her new environment Lilith creates a private world of her own. She withdraws into it, excluding all other people. The resident psychiatrists hold little hope for her recovery—until young Vincent Bruce, a disillusioned war veteran, walks into Poplar Lodge and asks for a job as an occupational therapist. Vincent, who yearns to find himself by helping others, tries manfully to help his lovely patient and to fight his growing love for her.

But it is a losing battle. It soon brings to the surface all the latent, destructive lust and evil in the lonely girl—and pulls the two inevitably towards destruction.

All this does not make a pretty story, and the telling is badly flawed by some pretentious, arty photogra-

phy and an insistent musical score that drowns out the words of the actors. A meandering scenario seems to detour around the plot at every opportunity. But even burdened as it is, the story remains plausible and touching. I can readily understand how a susceptible young man might fall in love with the elfin Lilith. It is a relief, too, to encounter a mental institution where most of the inmates are civilized, intelligent people as many mentally disturbed people are in real life, and where the Snake-pit type of ranting and raving is kept to a minimum.

An uncommonly talented troupe of actors breathes life into the difficult minor roles of the inmates. But as the star-crossed hero, Warren Beatty is puzzling at best. Sometimes he seems to be imitating Marlon Brando; at others, he is clearly afflicted with a Ben Casey image.

What lifts this curious film out of the ordinary—and makes it worth a trip to the theater—is the lifting performance of Jean Seberg as Lilith. She is lovely to look at and, happily, she is on camera most of the time. Every nuance of her delicate interpretation—anger, love, laughter, bewilderment, fear, pride, passion—is convincing. This is a revelation, for Miss Seberg is the same Iowa farm girl whom Otto Preminger promoted from nowhere into the starring role of his 1957 *Saint Joan*, and who was practically ridden out of Hollywood on a rail because of her ghastly performance in that sorry film. She fled to France and appeared in a succession of crashing flops (I missed *Breathless* which was praised, but I did see some of the others and can attest that they were all boneless turkeys). Now I am happy to report that Jean Seberg has become a lot more than just another dumb blonde. Perhaps there is still hope for Kim Novak and Tipi Hedren.

*by Richard Oulahan*





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## LIFE MUSIC REVIEW

### U.S. Roots of the Beatle Beat

**T**he Boston Pops is recording symphonic renditions of Beatle music. The Dave Clark Five is packing for its third tour of the United States. The top U.S. song in September was *The House of the Rising Sun*, a New Orleans bordello lament delivered by another mop-headed British group, the Animals. It seemed there was never going to be an end to it. Then a significant event took place: the Animals opened in New York and were almost unnoticed by the local teen-agers.

Did this lukewarm reception presage the end of the Mersey Sound? Whether the British invasion has actually stopped or only paused for breath, it's time that we look behind the whole British phenomenon, to separate the lasting, genuine fraction of popular music from the hours of conjured bunk that warm our car radios. The ironic fact is that all this English sound is American in origin, exported to Europe, popularized there and shipped back here by those British charmers. Now with the heat so widely acclaimed, the Americans who have been playing it for years may get something out of it for themselves.

The names of the following prophets without honor would draw a blank stare from most teen-agers in this country: James Brown, Bo Diddley, Chuck Berry, John Lee Hooker, Smokey Robinson. They are Negroes with Deep South roots, artist-writers first heard on small blues-oriented radio stations, obscure record labels, before ethnic audiences. Then, like the jazz greats, they found their way to Europe, where they drew enthusiastic crowds of fans and interested imitators. Their records became required listening for the rising British groups they frequently traveled with.

Each American group brought its own variations to the basic style. A beginner's course in rhythm-and-blues appreciation would have to include *Pure Dynamite*, the best example of James Brown's hypnotic compound of pulsating rhythm, gospel plaint and psychotic screams; Bo Diddley's *16 Greatest Hits* is characteristic of the steadily mounting beat of the master's guitar; Chuck Berry's control over the rhythms of daily speech shows beautifully in a similarly titled

collection. The high-pitched falsetto lyrics of Smokey Robinson come through with *The Miracles On Stage*. *American Folk Blues Festival* is a fine introduction to John Lee Hooker's Deep South blues.

Most of these songs were first cut in the 1950s, but all have been reissued recently on LP albums. If the Mersey sound is an art form, this is the music that gave birth to it, although not one of its inventors, not even the very popular composer-performer Ray Charles, has ever been as sought after, televised, filmed, interviewed and just plain loved as their English imitators.

Frequently, English groups have revived some of the very same tunes first cut by American outfits. You can compare the Beatles' *You Really Got a Hold on Me* with the original by a Negro quartet called the Miracles, recorded on Tamla Records, or match the Dave Clark Five's attempt at *Do You Love Me?* with the Contours' efforts on Gordy Records. It isn't that the Americans are invariably better or the Englishmen necessarily worse. The quality of the English groups' music has little to do with the English sensation.

**I**t has been the Britons' personalities, which white teen-agers readily understood and quickly worshiped, that have catapulted them to fame. In them, for the first time since Presley, legions of ecstatic adolescents found congenial spirits. They are frankly lovable and they make Presley look like a dirty old man by comparison.

Eric Burdon, the Animals' strident lead vocalist, frankly describes his sound as "a white effort at American rhythm and blues" and concedes that one reason for their success is that "we're young . . . and we're white." "But," he predicts, "the invasion won't last long. America has the good stuff. If the disc jockeys wake up and started playing the good stuff we'd be out of business." He may or may not continue to prosper, but Burdon knows where his musical roots are. Harlem's famous Apollo Theatre, he explained, is the true home for his sort of music, and he wasted no time in planning to visit it. "I've been waiting to go for years," he confessed.

While Burdon made plans for his visit to the Apollo, which is still going strong, anxious promoters of the Animals' American concert had made plans of their own. In order to bolster a sagging gate, they added none other than the veteran performer Chuck Berry to the program. Deep South rhythm and blues—and its performers—were starting to claim their own.

by P. F. Kluge





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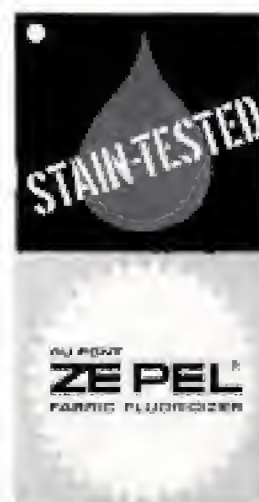
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***1965: The year of the Quick Wide-Tracks***







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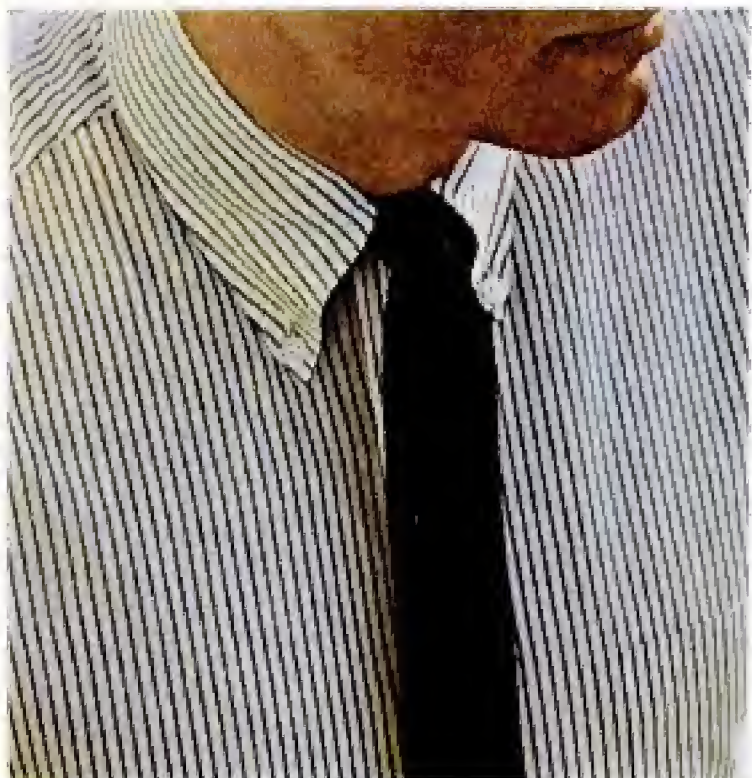
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## ***The good old days of space***

I used to know more about it than most people, but now I've lost touch with the whole business of manned space flight. That is, I don't any longer know beyond the most elementary information what the problems are and who is going to be flying what to where. The field has exploded beyond my comprehension and there are now so many Astronauts that a man needs a program to keep track of them. I'm beginning to have distinctly nostalgic feelings about the good old days of space flight, days that began for me barely more than five years ago. They were unique days, and they offered excitements of an intensity I will never know again.

Part of a LIFE team assigned to cover Mercury Astronaut activities in August 1959, I started with enthusiasm and with a couple of minor prejudices. To begin with, the term "Astronaut" sounded comic-bookish to me, a made-up tag prefabricated to glamorize a bunch of pilots. The second prejudice was a little more consequential. The advance ballyhoo, necessary perhaps as part of the effort to make the nation support the space program, had the effect of somehow reversing the normal evolution of heroism. Heroes usually become that *after* something extraordinary has happened. Here were men already getting some measure of credit for deeds they might do. But the Astronauts relieved me of that prejudice quickly. They were unanimously embarrassed by the extrapolation of future glory from their current status.

The problem in the long months before there were any flights was to keep reminding myself that something significant was going to happen. The training—in centrifuges and other simulators—began to seem an endless preparation for an imaginary event. Through all that, I was sustained by my growing acquaintance with the men. There were wide personality differences in a group selected on the basis of rigid standards. One, for example, stubbornly and unsuccessfully resisted an innovation in the capsule design that the others all wanted. Another took his disappointments much harder than the rest. One maintained a cheerful aloofness from the group. To one, at least, the possi-

bility of death was very clear; others scoffed at it.

My first view of a rocket launching was a violent reminder that the training would end. It was a night firing of a Mercury Atlas with an empty capsule riding the nose, and I was in a small group permitted to observe it from a roadblock a mile or two from the pad. Before the launch, searchlights played across the rocket's shining skin, and it steamed with frost. It looked beautiful and savage before the liftoff, and at that moment it became something much more. As the fuel flamed and the rocket started to rise, the whole area was washed with white light, and sound obliterated sense. The Atlas rose and seemed to hang, uncertain and tremendously destructive, directly over our heads. Then it turned and began ripping down the night sky away from us, the awesome sound and sight of it diminishing, leaving only the echoing thought with me that some friends of mine were eager to ride such a monster.

I watched Glenn's liftoff on television in the Glenn living room in Arlington, Va. From that vantage point the launching into orbit of the head of the household seemed like a very private affair indeed, and I would have preferred to be in any number of other places. There was a tension of love in the house that morning that no non-Glenn, however friendly or well intentioned, could share. I felt the same tension months later, standing on the lawn of a beach house in Florida with Rene Carpenter and her four children while we watched Scott's Atlas arc across the morning sky. Yet both these women—Annie Glenn fixing me a plate of lunch during the second orbit and Rene asking if I would like a drink during the endless half hour when contact with Scott's capsule was lost—made repeated efforts somehow to include me in, to communicate *their* understanding of my anxiety. That, it seemed to me then and does now, was hospitality of the highest order.

I went to Houston recently to see how the pioneer travelers are doing. Most of them are faced with a problem even greater than being declared heroes in advance. The fact is that most men's lives do not generally peak in single spectacular events. The Mercury Astronauts' lives did just that, and I wondered how things looked to them now

that the liftoffs and the presidential telephone calls and the parades are over—and now that another, younger generation of Astronauts is being trained.

The seven thrive. Alan Shepard is Chief Astronaut and is also active in a local banking business. Deke Slayton is an Assistant Director at the Manned Spacecraft Center. Scott Carpenter, recovering from a badly broken arm, is Executive Assistant to the head of the Center. Gus Grissom will fly the first Gemini mission, Wally Schirra is backing him up, and Gordon Cooper is deeply involved in the planning for the Apollo moon mission.

Rene Carpenter gave a party one night during my visit and all seven Astronaut wives and the four men who weren't out of town on space business attended. It was a good evening, full of laughter and surprisingly free of reminiscences. The ties that hold this group together are still far stronger than the jealousies and the differences that have sometimes divided them.

Still the past lingers. I spent one morning talking to John Glenn in his study. He has almost completely recovered from the fall that forced him out of the senatorial race in Ohio. It is likely that he will combine a consultant's position at NASA with a job in private business when he retires from the Marine Corps. During one pause in the conversation I fully picked up a glass-covered object from a table next to me. It was a tiny fragment of the Atlas booster that shoved him into orbit, and it had been recovered in Africa.

Then I noticed that the room was full of varying trophies and mementos of the flight—awards, photographs, plaques. Glenn pointed out with special delight the present his launch crew gave him. It consisted of a clock and timing devices identical to those which had been set in his instrument panel. Next to the clock, in the same mounting, was a small globe which turned at the rate of the capsule's passage over the earth, once every 90 minutes.

Glenn started the globe for me, and a music box hidden in the panel began to play the theme from *Around the World in Eighty Days*. As we both stood there listening, the flight of Friendship 7 suddenly seemed, if somewhat more advanced than the flight of Phileas Fogg's balloon, to have taken place almost as long ago.



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# ASSASSINATION: THE TRAIL TO A VERDICT



**RE-ENACTMENT.** The cross hairs of a gun sight zero in on a car simulating the presidential limousine at the assassination scene. At right, FBI man takes sightings with killer's rifle from sixth-floor window Oswald used. On floor below another agent briefs Warren panel.



INSIDE ACCOUNT BY A MEMBER OF THE COMMISSION

# PIECING TOGETHER THE EVIDENCE

by CONGRESSMAN GERALD R. FORD

*The author, Republican representative from Michigan's 5th District, is writing a book on his 10 months with the Warren Commission.*

The most important witness to appear before the Warren Commission in the 10 months we sat was a neat, Bible-reading steam fitter from Dallas. His name was H. L. Brennan and he had seen Lee Harvey Oswald thrust a rifle from a sixth-floor window of the Texas School Book Depository and shoot the President of the United States.

In the shock and turmoil that followed, Brennan had headed for a policeman and given him a description of the man he had seen in the window. The police sent out

a "wanted" bulletin based on that description. About half an hour later, as police interrogated the assembled employees of the Depository, the manager, noting that Lee Harvey Oswald was missing, had checked the personnel files for Oswald's address and description. The police then issued their second wanted bulletin based on the new information. After this second bulletin was issued, Officer J. D. Tippit stopped Oswald on the street and Oswald shot him dead.

The two descriptions differed in some details—although Brennan later identified Oswald in a police lineup—and it was this discrepancy which set off the first of the countless rumors concerning the President's assassination; namely, the story that two men were involved.

Thus, both here and abroad began the cascade of innuendo, supposition, imagination, twisted fact, misunderstanding, faulty analysis and downright fantasy that surrounded the tragic death of John Fitzgerald Kennedy.

Nonetheless, the basic story of the assassination that emerged in the first few weeks was never materially altered during the commission's investigation. There were no startling developments, no sudden turns of evidence or testimony that opened up truths previously unperceived.

After taking millions of words of testimony from hundreds upon hundreds of witnesses, the Warren Commission has established that there is not a scintilla of credible evidence to suggest a conspiracy

to kill President Kennedy. The evidence is clear and overwhelming: Lee Harvey Oswald did it.

There is no evidence of a second man, of other shots, of other guns.

There is no evidence to suggest that Oswald went to work at the Depository for the long-range purpose of killing the President, that Jack Ruby knew Oswald before he killed him, or that either of them knew Officer Tippit.

There is no evidence, in short, that Oswald was more than a man alone—a sorely disturbed person whose need for recognition, at any price, festered under his own terrible inability to attune himself to his fellow man.

President Johnson phoned me at home one night, a week after the

CONTINUED ON PAGE 47



**PRESIDENTIAL PANEL.** Members of the commission that investigated the assassination sit for a formal portrait. From left: Rep. Gerald Ford (Rep.)

of Michigan; Rep. Hale Boggs (Dem.) of Louisiana; Sen. Richard Russell (Dem.) of Georgia; Chairman Earl Warren, Chief Justice of the United

States; Sen. John Sherman Cooper (Rep.) of Kentucky; John J. McCloy, and Allen Dulles. J. Lee Rankin, at right, is chief counsel to the commission.

## Color sequence shows how the President was killed

One of the most important pieces of evidence to come before the Warren Commission was an eight-second strip of 8-mm color movie film taken by a bystander while the bullets were striking the President.

After a painstaking analysis of the film the commission concluded that three bullets had been fired from above and behind the President, and not from in front as the doctors who saw the wounds had originally suggested. The color pictures on the cover of this issue and on the next four pages are taken from the film. The crucial sequence is shown in eight frames beginning on the opposite page and described below by number.

**1.** A moment before the first bullet was fired, the President and Mrs. Kennedy, Governor and Mrs. Connally, smiling and waving, were passing in front of the brick building where the assassin was taking aim.

**2.** President Kennedy clutched his hands to his throat. The commission determined that a bullet had entered the back of his neck and ripped through the lower front portion of his throat. They believe the wound would not necessarily have been lethal.

**3.** As Mrs. Kennedy reached to help her husband, Connally twisted in pain. Some members of the commis-

sion believe the governor was struck by the same bullet that had emerged from the President's throat, and that Oswald's second bullet missed. Connally, however, believes he was hit by the second bullet. He told the commission he heard a shot and turned to his right to see if Kennedy was all right.

**4.** Both Kennedy and Connally began to slump. A Secret Service agent sitting beside the driver turned to look back while onlookers, unaware that anything was amiss, applauded.

**5.** The President's head fell forward into Mrs. Kennedy's arms just be-


fore the assassin fired another bullet.

**6.** The assassin's shot struck the right rear portion of the President's skull, causing a massive wound and snapping his head to one side.

**7.** As the President lay dying beside her, Mrs. Kennedy pulled herself out of the seat.

**8.** Crawling on her hands and knees across the rear deck of the limousine, Mrs. Kennedy reached out to Secret Service man Clinton Hill, who leaped aboard. He pushed Mrs. Kennedy back into the car and the driver raced to the hospital, 3.4 miles away.





## FACTS AND PHOTOS THAT SHAPED THE WARREN REPORT

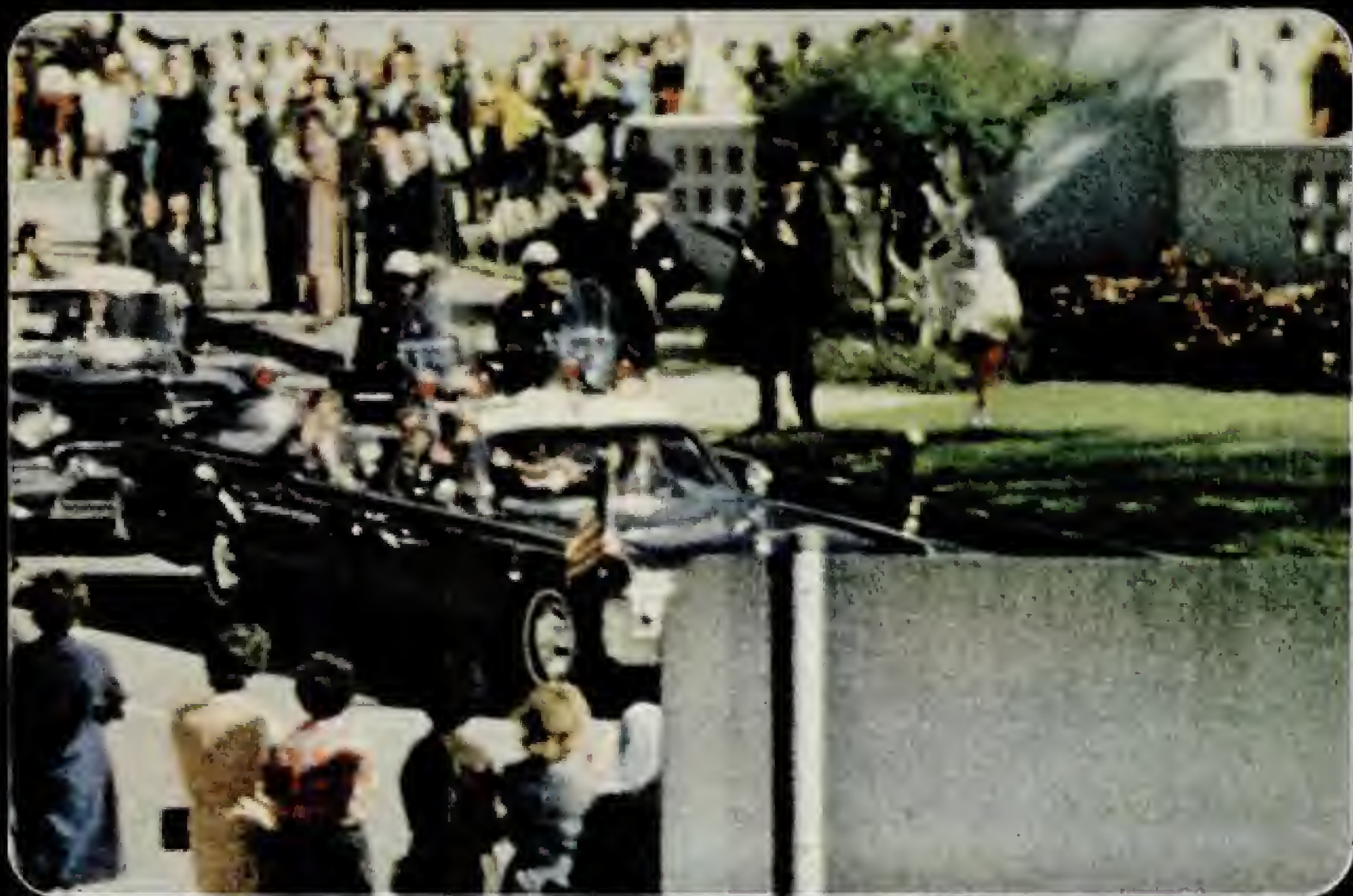
It was a monumental and historic task that the Warren Commission undertook 10 months ago and completed last week. The quest for every available shred of evidence surrounding the assassination of President Kennedy led each member of the panel to Dallas. On the spot there FBI agents re-enacted the murder, lining up an open limousine under the cross hairs of the actual rifle used by the assassin. All over the U.S. 15 staff lawyers followed up leads, aided by the full investigative forces of the U.S. and, in Texas, by state and local authorities. More than 20,000 pages of testimony were taken—the panel's 296,000-word report is itself only a summary of two dozen 500-page volumes.

The major significance of the report is that it lays to rest the lurid rumors and wild speculations that had spread after the assassination. It also confirms the basic facts assumed since that tragic Nov. 22: that Lee Harvey Oswald did it, alone, and that Oswald in turn was killed not in any dark conspiracy to silence him but by another individual, Jack Ruby, who acted entirely on his own. Beyond this, the report adds a welter of previously unknown detail about the deed and the labyrinthine trails that led to it.

On the following pages, a member of the Warren Commission, Representative Gerald Ford of Michigan, tells how he and his fellow members carried out President Johnson's mandate to satisfy themselves "that the truth is known as far as it can be discovered." Accompanying his exclusive article and illuminating its points is the split-second sequence of color pictures—taken as the bullets struck—some of which previously were published in *LIFE*'s special memorial edition to President John F. Kennedy.



1



2





3



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# NAILING RUMORS OF A CONSPIRACY

## WARREN REPORT CONTINUED

assassination, to ask me to serve on the commission. Probably every member protested the pressure of work, as I did, and doubtless the President answered them much as he did me: "That's what they all say, Jerry." Of course I accepted.

At the outset, we broke the investigation down into these areas: the assassination itself—the President's trip to Dallas, the actual shooting and the events before and after; Oswald's movements before and after the assassination, ending in his capture and then in his own murder; Oswald's background, from birth to death; details of Oswald's trip to Russia; details of his murder by Ruby and the possibility of prior association with Ruby, and, finally, the problem of security measures to protect future presidents.

Our chief counsel was Lee Rankin, Solicitor General in the Eisenhower administration. He picked a handful of skilled men to work directly under him. From the start we felt it was important that a strong part of our staff come from outside the ranks of government, and to this end we selected a dozen of the finest lawyers in the nation to serve as consultants. Most of them have worked nearly full time.

It would have been a bulky and time-consuming process to recruit our own investigators. Instead we elected to rely on the many agencies of government which already were involved—the FBI, Secret Service, State Department investigators, Treasury agents, Internal Revenue agents, and others. To back up our expert testimony on things like ballistics and handwriting, we tapped state and local agencies as well.

As the lines of the investigation emerged, we tried to backcheck each report to avert any softening of facts that might have occurred due to any agency's policy or position in relation to the assassination. Each of the endless rumors that spread like so many oil slicks had to be traced to its origin; depositions had to be taken and witnesses called.

Before we began any of our own investigations, we had to digest the massive reports which the federal agencies had gathered in the days immediately after the President's death as well as the reports of the Texas authorities. Then we

plunged into the voluminous task of examining the people who were, in one way or another, involved by chance or association.

This brought before us an unusual cast of characters.

There was the mother, Mrs. Marguerite Oswald, a singularly angry woman whose strange attitudes and actions provided an appropriate background for the strange son she had shaped. Mrs. Oswald's irrational allegations gave rise to one of the most persistent and dangerous—and completely untrue—rumors: that Lee Harvey Oswald was, or had been, an agent of the U.S. government.

There was, also, Oswald's handsome Russian wife, a quiet young woman who at first seemed simple and direct and eager to cooperate—but who, as time went on and conflicts began to develop in her testimony, emerged as a complex and even mysterious person.

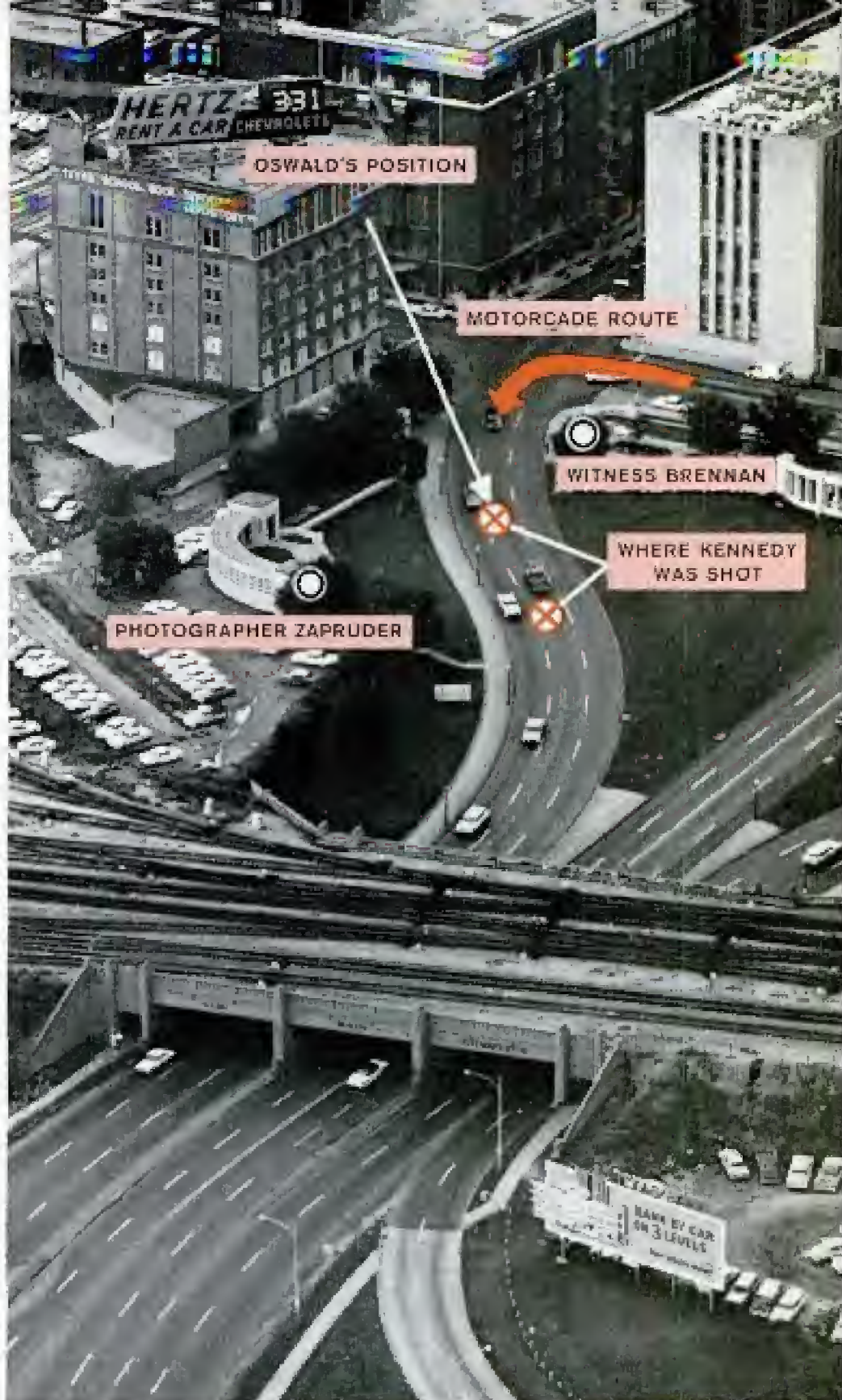
There was Robert Oswald, the brother, who came out of his erratic childhood passionately desiring stability, a solid and hard-working man whom Lee seemed somehow to have loved and yet held in sharp contempt for just these traits.

There was Jack Ruby, a sad and strange little man in the Dallas County jail who had killed the only man in the world who could have said with certainty just what happened.

And finally we came to know Lee Harvey Oswald himself, as well as any obscure man can be known after he is dead—particularly after he has spent a critical two-plus years of his life behind the Iron Curtain.

When Oswald was coming home from Russia, he toyed with the thought of writing a book. As a beginning, he jotted down a foreword. That scrap of paper, filled with misspellings, survives in the commission files: "Lee Harvey Oswald was born Oct. 18, 1939 to an insurance salesman whose early death left a ——— [the dashes were Oswald's] mean streak of independence brought on by neglect. . . ."

The full details of Oswald's nearly three years in the U.S.S.R. will remain covered in mystery until and unless the Soviet government opens its files completely. It has not done so yet. Just after Presi-



## Site of the shooting, and one man who saw it



H. L. Brennan (*left*), a Dallas steam fitter who had waited to see the motorcade pass, is the only known witness who actually saw Lee Harvey Oswald fire his rifle at President Kennedy. The photo above shows where Brennan was sitting (*white dot*) when Oswald opened fire. A white arrow from the sixth-floor window traces the first bullet to strike Kennedy when the presidential limousine (*route marked by red arrow*) reached the spot indicated by the top red cross. The second cross shows where the car was when the President was hit by a second bullet. When Brennan heard a shot, he quickly looked up and clearly saw Oswald in the window shooting again. Brennan's description of Oswald was broadcast by police. Later Brennan identified Oswald at a police lineup. At left (*white dot*) of curve, Abraham Zapruder was shooting the color pictures seen on these pages.

CONTINUED





## Retracing the killer's path on the fatal day



Lee Harvey Oswald's escape route (shown above by solid and dotted red lines) was tracked by the Warren Commission. Leaving the scene of the assassination, he caught a bus but left it when traffic bogged down. Then he took a taxi across the Trinity River, got out beyond his rooming house, quickly doubled back, switched jackets and apparently picked up a .38 revolver. The specific route of Oswald's next move is unknown but is indicated by dotted line. Exactly 46 minutes after the assassination, witnesses did see Officer J. D. Tippit pull alongside Oswald and get shot four times. Oswald started, as one witness described it, "in a half trot." He dodged in and out of hedges and parking lots and turned onto Jefferson Boulevard. (By coincidence this thoroughfare passes near the apartment of Jack

Ruby.) He shed his jacket while running. On hearing police sirens Oswald frantically tried to hide in a shoeshop doorway, then ducked into the Texas movie house. Between the time Tippit approached him and when he entered the theater 12 witnesses saw Oswald with a pistol in his hand. As police entered he jumped up and tried to shoot Officer M. N. McDonald, but failed, and was hustled away to police headquarters (left).

Among the evidence seen by the commission was a snapshot (right) taken by Oswald's wife Marina in the spring of 1963, showing him wearing a revolver like the one that killed Officer Tippit and holding the rifle that killed the President. At Dallas police station after Oswald's arrest, Detective J. C. Day (far right) holds Oswald's rifle, found in the book depository.





# MOTHER'S MYTH: OSWALD WAS A PAID U.S. AGENT

WARREN REPORT CONTINUED

dent Kennedy was killed, the Soviet government, perhaps realizing that its position was equivocal because of Oswald's background, rather dramatically handed over certain files to U.S. authorities. The information was of little value, and thereafter the Russians answered our additional questions with bare minimums of information.

But it did become unmistakably clear that never in his life—here, in Russia, or anywhere else—was Lee Oswald satisfied with the environment in which he found himself. When he returned to the U.S., this same discontent quickly overtook him and he began to look to Cuba as the place where his worth might be recognized and his shadowy philosophical theories might finally come to fruit. For, from the time he was 15, I believe his faith in Communism and the writings of Karl Marx as he understood them was one of the main motivating forces of his life.

Only a few weeks before the assassination, Oswald visited the Cuban and Soviet consulates in Mexico City to arrange entry to Cuba. Both consulates largely ignored him. It was a time of crushing frustration for Oswald. We have in our commission files a violent letter of complaint sent to the Soviet embassy in Washington, implying that the petty bureaucrats in the consulates in Mexico did not seem to realize who Lee Oswald was or the importance of what he was doing.

Before he went to Mexico City, Oswald had told his wife, "I'll be premier in 20 years." Now he came home, nearly broke, dejected, unwanted.

As always, there was not a single meaningful relationship between Oswald and any other human being.

There was no solace at home. As Marina Oswald's testimony developed, it was obvious that their life together had been stormy. He lived away from home much of the time. In the last year of his life, he was bringing to a peak his growing capacity for violence and his deep, overpowering hatred of authority.

A week before the assassination, Oswald had a bitter argument with his wife. When he came home on the Thursday night before the Fri-

day on which he shot President Kennedy, Marina believed he had come to make up, but she did not permit the reconciliation. In fact, he had come home to get his rifle. He left the next morning before anyone else was up.

Mrs. Oswald was to see her husband just once more. He was in the Dallas city jail and he told her simply that everything would be all right.

**M**arina Oswald was the first witness we called. She appeared in a neat blue dress with light touches of make-up. Her manner was subdued. When she was asked to identify her husband's clothing, she broke down, and the Chief Justice, in his gentle way, soothed her back to composure. By far the most poignant part of her testimony was her description of the afternoon of the assassination.

Marina said that when she and Mrs. Ruth Paine, the woman in whose house she lived, heard the news of the President's murder, "We both turned pale. I went to my room and cried." Later, Marina testified, Mrs. Paine said, "By the way, they fired from the building where Lee is working."

Mrs. Oswald continued: "My heart stopped. I went to the garage to see if the rifle was still there and I saw that the blanket [in which Oswald normally kept it wrapped] was still there, and I said, 'Thank God.'"

She did not then look inside the blanket, which appeared undisturbed. When the police arrived and asked if her husband had a rifle, she led them to the garage. She thought, "Well, now they'll find it." One of the officers put a hand under the blanket and lifted and it folded over his hand. It was empty.

This was an intensely dramatic moment in Marina Oswald's testimony. There was a look of complete distress on her face. "Of course," she said, "I already knew that it was Lee."

Oswald's mother was the next witness. She appeared in a black dress and at the time I noted on a pad that she was "aggressive, dogmatic, difficult." She told wild stories, frequently forgot her point, meandered through blind and unproductive asides. When we tried to get her back on the track, she denounced us for interrupting.

But Marguerite Oswald's widely publicized "secret agent" theory was traceable in the tangled lines of her testimony. She never accepted the fact that her son had simply taken off to Russia, leaving her destitute. Instead, she decided that he must have been sent to Russia on a secret mission for our government. Since her need was indeed genuine, she went to Washington to demand of various officials that her son be recalled to the U.S. so that he could support her. She had even tried to get into the White House to petition President Kennedy.

Within two months of this, she had received a letter from Lee, in which he indicated he would soon be trying to come home. She took this for confirmation that her demands on government officials had prevailed. After the assassination, she simply revived her belief that he was an agent and told everyone who would listen that this had been the case.

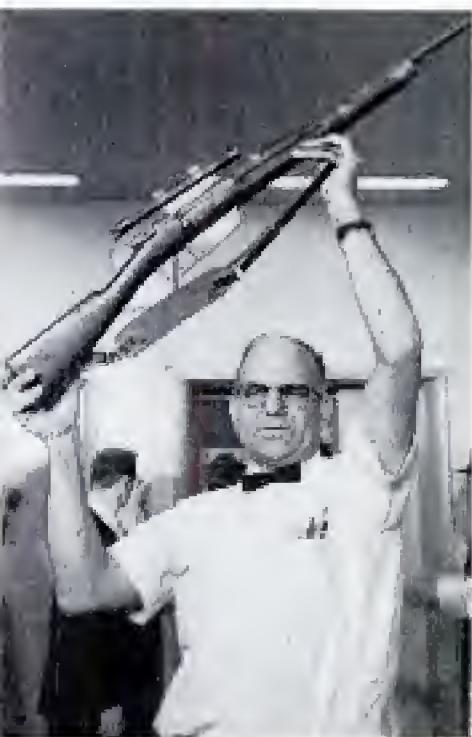
The result was a massive search by the commission to prove or disprove the secret-agent theory. First we took the sworn denials of the directors of various agencies in Washington—men like J. Edgar Hoover and Secretary of State Dean Rusk. We quizzed personnel from the U.S. Embassy in Moscow. We sent our own men into the agencies involved to study their old personnel files.

We were, and we are now, convinced that Oswald was never an agent for the U.S. government.

**W**e interrogated Jack Ruby in an austere little jury room which had a sink at one end, and a long narrow table around which we all sat. Ruby wore sandals and a white jumper with several buttons undone. Though he told us no more than he claimed at his trial—that he had been moved only by his horror at the assassination—it seemed to be touch-and-go whether we could keep his nerves from exploding. He was terribly tense and, at one point, balked completely. Suddenly Sheriff Bill Decker of Dallas roared at Ruby, "Now be a man with a bunch of men that have come a long way to give you an opportunity to [talk]."

I was afraid that would blow everything up—but instead, Ruby began talking again. From this and other sessions, and from total

CONTINUED





# CONCLUSION: ONE RIFLE, AND ONE RIFLEMAN

## WARREN REPORT CONTINUED

examination of the lives of both Ruby and Oswald, we were convinced there was no prior relationship between Ruby and Oswald.

There were several trips to Dallas and on one of these the staff conducted an extraordinary experiment. It actually re-created the assassination, taking a similar car through a foot-by-foot re-enactment of what had happened. The restaging was based on three strips of movie film of the actual event, plus a variety of still photographs.

By making a triangulation with surveyor's transits located at the precise point at which each photographer had been standing, we were able to place the car exactly at each step.

A man of John Kennedy's approximate build rode in the President's seat. On the jump seat in front of him, just where Governor Connally had sat, was another stand-in wearing the actual coat Connally had worn on that day, the bullet hole outlined in chalk.

The rifle Oswald had used was mounted in the window from

which he had fired, and a camera was fitted to its telescopic sight. The car was taken foot by foot down the sloping road and photographed again at each spot in its passage. By coordinating these photos and from a very close study of the evidence, the commission was able to conclude with certainty that there were three shots.

I personally believe that one of these three shots missed entirely—but which of the three may never be known. I believe that another struck the President in the back and emerged from his throat, and that this same bullet struck Governor Connally in the back and emerged from his chest, then went through his right hand and pierced his left thigh.

Governor Connally does not agree with this. He thinks the first bullet struck the President, the second hit him alone, and the third struck the President's head. Nevertheless, it is frequently true that a wounded man does not know immediately when he has been hit. I think that Governor Connally did not know for an instant or two that he himself was

wounded as well as the President.

Certainly there is no question that a following bullet finally killed President Kennedy, inflicting a massive head wound. From the moment that bullet struck, there was no question of a chance for survival. In effect, the President was dead at that moment.

**A**s we proceeded through experiment, investigation and testimony, we came to feel more and more confident of our facts. But the matter could not be considered finished until each of the hundreds of rumors was run to ground.

There were, for instance, the tales emanating from a crowd picture that included one Billy Lovelady, a youthful employee of the Depository. At the moment the President was shot, Lovelady was standing with a group of fellow employees at the Depository's front entrance. One of the pictures taken at the time of the assassination showed him in the background. When blown up, the grainy image bore a surprising resemblance to Lee Oswald.

This provoked a storm of rumor here and abroad. Major newspapers ran the picture and asked how, if there was a possibility that this was Oswald, it could be said that Oswald had himself fired the shot. Did not this give credence to the theories that there were other gunmen, who were upstairs while Oswald was down? Or to the theory that Oswald was the wrong man?

The doubt was compounded by Lovelady's own actions. He virtually went into seclusion, refusing to talk to reporters or to allow his picture to be made. It is hard to blame him. Immediately after the assassination there was an almost tangible aura of fear in Dallas. Even important officials could not be sure in the first hours that a major plot was not underway. (H. L. Brennan, who actually saw Oswald shoot the President and provided the first description, decided soon afterward that his own life was in critical danger. At the first police lineup, he later told us, he recognized Oswald immediately but feared to admit it. At the second lineup, he made the identification despite the feared consequences.)

The commission questioned Lovelady, and in the absence of publicity he identified himself in the picture immediately, saying he had been standing precisely at that spot. Several other employees testified that they had been there with him. The Depository manager



## Three witnesses and a photo of a mystery man

**KEY FIGURES.** In the basement of the Dallas police station, nightclub owner Jack Ruby (*left*) drew a revolver and fatally shot Lee Oswald in the stomach while newsmen and police, momentarily frozen, watched helplessly—and all the world wondered whether he did it to silence a partner in a conspiracy. Oswald's mother, Mrs. Marguerite Oswald (*second*

*picture*), called "aggressive, dogmatic, difficult" by commission member Ford, loudly demanded to be heard by the panel, insisted her son was not the assassin—and that he had been a U.S. agent in Russia. After a thorough check the commission quashed the claim. Arriving to testify for the first of three appearances before the commission, Mrs. Marina Oswald

(*third picture*) was shy before a smiling Chief Justice Earl Warren, who soothed her when she broke down on the stand. Speculation that Oswald could not have been the assassin was ignited by the discovery of the photograph at the far right. It showed the crowd, the Book Depository in the background, and Kennedy clutching his throat in the car at the instant



agreed that the picture plainly was of Lovelady, not Oswald. And that was all there was to that.

Then there was the rumor that there had been a sheriff's office alert of trouble at the Depository at 12:25 p.m. on Nov. 22—five minutes before the assassination. Did that mean someone knew in advance there would be trouble? Was this not evidence of a plot?

We checked the records of the Dallas County sheriff's dispatcher desk and found that the call, tape-recorded and time-keyed, had been issued at 12:30 p.m., just after the shots were fired.

The "second rifle" also touched off misleading talk. The weapon which killed President Kennedy was a Mannlicher-Carcano rifle; it was made in Italy. Oswald purchased it secondhand.

But an early report had quoted police as saying the rifle was a Mauser, which is made in Germany. The two rifles bear only slight resemblance. Result: more public confusion—except among subscribers to the "conspiracy" theories, for whom it was further proof of more than one gunman. When police insisted that there had been just the one Italian rifle, it seemed to many that they were trying to hide something.

We had to go back to the afternoon of the assassination to set this rumor straight. When Oswald fled the sixth floor of the Depository, he had thrust the rifle behind a

stack of boxes. It was found by the first investigating officers and a guard was put over it until the weapons and fingerprint men arrived.

A reporter, facing an immediate deadline, asked an officer standing nearby what make the rifle might be. He said he thought it might be a Mauser. The reporter filed his story, calling the gun a Mauser, and the description was relayed around the world. Although it was followed by a correction, the error stirred up wide suspicions.

Perhaps the most rumor-ridden subject of all was the direction from which the shots were fired. Many people found it difficult to believe that anyone but a superb marksman could have fired three shots so quickly and so accurately. Our tests indicated, however, that this was *not* a remarkable feat.

There also are those who insist that Oswald, in the time available to him, could not have got from the sixth floor of the Depository to the second, where he was observed moments after the shooting. I ran down those steps myself stopwatch in hand. There was time for him to make it.

There were also some cruel happenstances that day which broke in Oswald's favor. Several carpenters had been working on the sixth floor, laying a new plywood floor. At lunchtime they all went down-

stairs. Had they stayed at the job-site while eating, Oswald would have been denied his concealment.

Another young employe actually did eat his lunch on the sixth floor that day. He left a few chicken bones, which at first had been thought to have been Oswald's lunch. Had this employe stayed to watch the parade from the sixth floor, Oswald might have been thwarted. Instead, he joined two others on the fifth floor, at windows directly underneath the point where Oswald installed himself and waited for the President to appear.

And so the three men heard the shots fired, the ejector mechanism working, the shells hitting the floor just over their heads. The reverberations dislodged plaster that sifted down into their hair. Subsequently, their eerie testimony pinpointed the rifle shots.

When I was in Dallas, I stood in that same place while an investigator worked a rifle on the floor above. I too could hear the ejected shells hitting the floor.

Perhaps because of early confused reports on the President's wounds, there have been persistent rumors, too, that a second gunman—or even the only gunman—was near the railroad overpass which overlooks the scene of the assassination.

But from 10 a.m. that day, the

overpass had been sealed off by Dallas Patrolman J. W. Foster to all but railway employes. A railroad towerman could see the whole area. He saw no strangers in the yard. When the motorcade appeared, the handful of spectators on the overpass clustered to the railing. Foster stationed himself slightly behind them and all were within his range of vision.

When the shots were fired, Foster thought immediately that they came from the area of the Depository. Others present had a variety of other theories, which were subsequently advanced to reporters. The towerman, as an example, couldn't be sure whether they came from the Depository or the overpass; he said he had noted in the past that, because of echoes in the area, noises originating from either place tended to sound the same.

In any event, no one present at the time saw anything at all suspicious.

Thus we came, gradually and finally, to the end of our assignment. We had become masters of much more information than we had expected to gather, veterans of many more twisting trails than we had expected to follow. We spent nearly two months writing our massive report—on which all of us, with our different backgrounds, are agreed.

This report is the truth as we see it, as best we know it, and on this, we rest. **END**



he was shot. Close examination of an enlargement of the area in front of the Depository (above) showed a man (arrows) who seemed to resemble Oswald. If it indeed was he, then it would not have been possible for Oswald to have fired from the window. But a check of Depository workers revealed the man was not Oswald but Billy Lovelady, another employe.

CONTINUED





## Bureaucratic blunders left J.F.K. a target



FBI Chief  
J. EDGAR HOOVER



Secret Service Head  
JAMES ROWLEY

For decades historians will analyze the Warren Commission's report down to the last tragic detail. But one question will glare forever. How did it happen that a known psychotic, a man with a Marxist bent who had defected to the U.S.S.R. and who had worked in the U.S. on behalf of "fair play" for Castro's Cuba, could possibly have been allowed to go unwatched during President Kennedy's visit to Dallas? Even worse, how was an individual with a fat FBI dossier permitted access with a gun to the Texas School Book Depository, commanding as it did—within easy range—the scheduled route of the presidential motorcade.

The answers all trace to bureaucracy. A mandatory channel between the FBI and the Secret Service, the government agency specifically charged with protecting the life of the President, had never been established.

The Warren Commission calls the Secret Service record system archaic. Its files, the commission found, listed only individuals who had actually threatened the President. Where citizens of Dallas were concerned, the Secret Service files were blank. Aware of the ugly incidents during Adlai Stevenson's earlier Dallas visit, the Secret Service agent in charge of investigating Dallas prior to the President's trip improvised his own inadequate file of extremists—but he had no liaison with the FBI and its own voluminous files on Lee Harvey Oswald. Whoever was to blame, the fact is that the two agencies failed to get together, and neither gave the other the cooperation needed to protect the life of the President.



**DALLAS MEMORIAL.** A few dozen yards from the spot where President Kennedy was killed as his open limousine approached the railroad over-

pass (background) stands the concrete peristyle of Dealey Plaza. Here the people who still flock to the scene day and night have made a make-

shift memorial of a flag-decorated stand where they leave their tributes of flowers with notes that say "We love you," and "Lest we forget."





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This is the Lincoln Continental for 1965: America's most distinguished motorcar.  
It is the luxury automobile that stands apart from all other cars.  
It distinguishes you among fine car owners.



world's highest standards. Available in a deliberately limited edition of models: the classic four-door sedan and America's only four-door convertible. Among luxury cars, there continues to be only one Lincoln Continental. What does your car say about you?

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They grow in special rich soil  
out in the sunshine.

And the big tomatoes ripen for  
40 days and 40 nights.

And they simmer in  
Hunt's own blend of seven spices.

THEN they go into the bottle.

And you get Hunt's... the catsup  
with the big tomato taste.

Hunt Foods, Inc., Fullerton, Calif.



*HERBERT VON KARAJAN DOMINATES EUROPE'S  
CONCERT STAGE*

CLOSE-UP

# 'HERR MUSIK DIKTATOR'



CONTINUED



## Steely genius who has to run the whole show

He looks (*see previous page*) like a handsome, musical Karloff exorcising a witch, and he acts like a feudal tyrant. He is a little of both. Arrogant, versatile, brilliant as steel and as tireless, Herbert von Karajan, at 56, is Europe's leading conductor—and perhaps the world's. He has a lifetime job as director of the prestigious Berlin Philharmonic. He has just quit the equally famous Vienna State Opera because they would not let him run the whole show. He then turned down the most sought-after job in European opera—the directorship of Milan's La Scala. And now he is getting ready for his latest invasion of America, a 24-concert tour and a sure sell-out.

Permitting a rare invasion of his privacy, Karajan invited *LIFE* to visit him in his native Salzburg and at St. Tropez. Here we discovered the warmer side of the man his European friends and enemies both like to call "Herr Musik Diktator."



Preparing Strauss's *Elektra* for the Salzburg Festival, of which he is principal conductor, Karajan, who bosses all phases of this opera, joins

his production assistant to shout stage directions at the cast (*above*), leads singers as his set designer stands by (*below*) and rehearses the orchestra (*right*).





Pictured hiding its reasonable price under all that luxury is a '65 Chevrolet Impala Sport Sedan.



## Beautiful Shape for '65—CHEVROLET Everything over, under and around you will be beautifully different

The roof, front, back, side, height, length, room, trim, windows, dash, upholstery, frame, suspension, colors—everything's new, finer, more luxurious everywhere you look.

What this new Chevrolet amounts to is almost a new kind of land travel!

Chevrolet for '65 meets the road with Wide-Stance wheel design and silkier Jet-smooth ride. Carries you along on a new frame that's as silent as it is strong. Baffles bumps with an ease that must make other cars jealous.

Inside, there's enough to make a Royal Suite jealous. Step into an Impala Sport Coupe or Sedan and find door-to-door carpeting, luxuriously upholstered seats designed to be lived in, an instrument panel that lives up to its simulated wood-grain trim. All this feels even

better with new roominess to enjoy it in. More shoulder room. More front leg and foot room with smaller floor tunnels. And the added luxury of curved glass side windows.

For '65, you set it all in motion with Sixes and V8's ranging from a 140-hp Turbo-Thrift Six to a 400-hp Turbo-Fire V8 available at your order.

Then link this action to your fingertips in one of these four ways—Powerglide, Overdrive or 4-speed Synchro-Mesh shift, if you request it, or standard 3-speed Synchro-Mesh. We should also mention a best seller list of luxury and

convenience equipment that's yours for the ordering.

All that's left is the looks. But why try telling you what you can see so clearly for yourself? . . . Chevrolet Division of General Motors, Detroit, Michigan.



Now turn the page  
to see the first all-new Corvair in 5 years.





# KARAJAN CONTINUED

With his wife Eliette, 29, an ex-Dior model (his previous two marriages ended in divorce), Karajan sails off St. Tropez in his 30-foot sloop. "Sport is my lifeline," he says. "Some people try to make me into a monk. My wife is young, sensitive, beautiful, full of life and enthusiasm and an excellent cook. I am constantly battling an increased waistline, but her French cooking is so good it's impossible to resist."



CONTINUED





## Beautiful Shape for '65—CORVAIR

If this one doesn't knock you right off your chair,  
we can't imagine what would

It took one of the most dramatic car changes ever made to bring you this new beauty with the international look. Here, briefly, are some of the wonderful things we've done to the 1965 Corvair.

First, there's racy new hardtop styling on every Corvair Sport Coupe and Sport Sedan—even the lowest priced ones.

And all are longer and lower than Corvairs of old, yet with curved side windows to give you more shoulder room inside.

The steering is even quicker, too. The ride is steadier with its new 4-wheel independent suspension. The brakes are bigger. The wheels, both front and rear, are spread farther apart to keep them as cemented to the road as the pavement itself.

There's an interior in Monza models that

reminds you of those you've seen in some frighteningly expensive sports cars. Bucket seats, door-to-door deep-twist carpeting, business-like control panel with all the dials grouped into a cockpit-like cluster.

There's a whole brand-new top-of-the-line series of Corvairs for '65 called *Corsa* with special trim, special instrumentation and very special performance. The standard rear engine is 140 hp or there's a new 180-hp Turbo-Charged version that you can add instead.

We can't help but feel that the '65 Corvair is the new sporty American car Europeans

will be clamoring to import. We can't help but feel you're going to be clamoring, too. So hurry and see one now at your Chevrolet dealer's. Then try to give up the idea of buying one. Just try. . . . Chevrolet Division of General Motors, Detroit, Michigan.



Please turn the page for more that's new.





Daughter Isabel, 4, steers the Karajan power launch from her father's lap. Isabel, whose sister Arabelle is 10 months,

has her father's iron will and her mother's looks. "It's lucky we have only daughters," says his wife. "If we had a son

it would be hell on me and the son, Herbert would never let him ski or fly or play the piano for fear he might do it badly."



New Malibu Super Sport Coupe in Regal Red, one of 13 new Chevelle colors for '65.



## Beautiful Shape for '65—CHEVELLE

**New ride, new style and an engine that makes any driver feel young**

**On one hand, the '65 Chevelle makes you feel settled and wise and rich with its smooth new ride and plushness all about. But then on the other hand, there's a frisky power story!**

There are enough changes in this '65 Chevelle to make it look and act like another whole new car from Chevrolet.

The front's been restyled. So has the back. The interiors are done up in some of the richest looking vinyls and fabrics around.

The ride is amazing. We've patterned Chevelle's Full Coil suspension after those in cars costing far more.

And if you'd like to hear how quietly it rides with its softer springs and extra body insulation, just put your fingers in your ears and listen.

As for that frisky power, you get it in either of two V8's you can add, ranging all the way up to 300 horsepower. That makes five engines for Chevelle now, including the standard 120-hp Hi-Thrift Six.

And the list of special options and accessories you can order goes on and on. Four-speed manual shift. Automatic Powerglide. A luxurious vinyl roof cover for the Sport Coupes. A new AM-FM Stereo radio that makes you think the musicians came with the car.

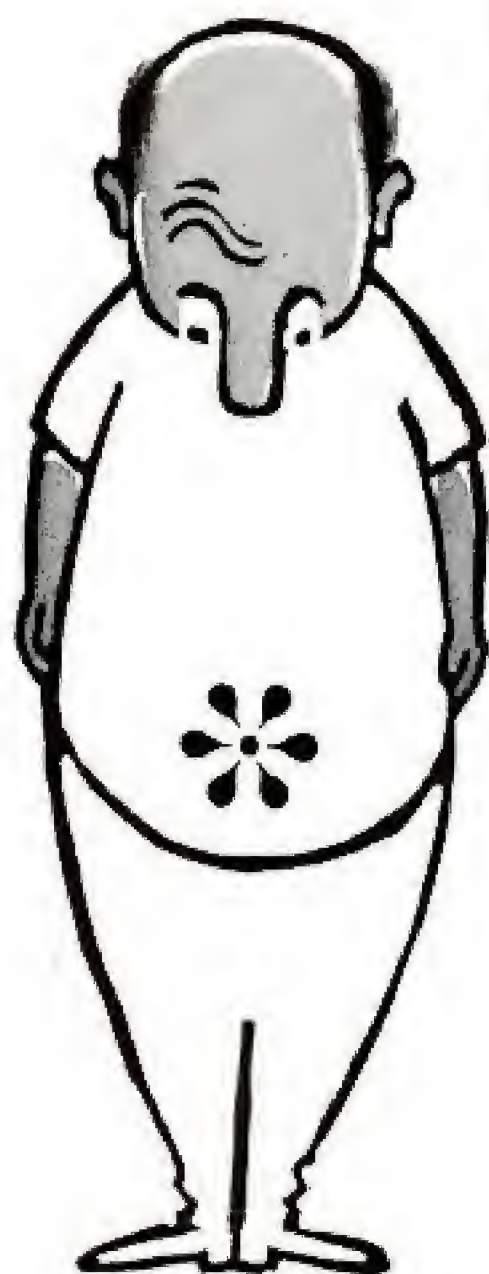
Twelve Chevelle models in four series and

in 15 colors (13 new) to choose from for '65—and all available with big V8's! . . . Chevrolet Division of General Motors, Detroit, Michigan.



Coming next—  
the most powerful tightwad in town...





## \*UNCERTAIN STOMACH

When your stomach feels uncertain from indigestion, heartburn, gas pains, nausea or other symptoms of excess acidity, remember this: Each small **PHILLIPS' TABLET** consumes 37% more excess acid than the leading candy-type roll antacid tablet.



Karajan pilots his own plane. He says, "It's not a feeling of power or exaltation or speed that thrills me about flying—nor relaxation, since the weather around Salzburg is so bad. Flying is just part of my passion for more knowledge. To improve myself is as important to me as the air I breathe."



## 'At 3½ I was under the piano'

by PETER DRAGADZE

A 20-room chalet in St. Moritz and a 10-room villa in St. Tropez (both with swimming pools), a 1,000-hp twin turbo-prop Beechcraft plane, a 300-hp Ferrari Gran Turismo racing car, a Porsche 120 and a Jaguar 250, a Bertram-25 motor launch, a 30-foot sailing boat and about a million dollars in the bank—these possessions, usually identified with tycoons or film stars, have all accrued to Herbert von Karajan for his work on the podium.

He has acquired all his wealth and most of his prestige in the past dozen years. Some sensational performances in the early 1950s at La Scala brought him the post of conductor of the Berlin Philharmonic and director of the Vienna State Opera. His high-handed methods at the opera kept things in an uproar, but they also restored greatness to the famous old company. Last spring the Minister of Education, whose name is Piffl (yes, Piffl), announced that he was now the boss of all cultural activities in Austria, including the opera. Karajan, who refuses to have any boss over him, quit. "True art must die when it depends on the whim of a glorified clerk," he declared loftily. "I will never set foot in Vienna again."

Then he rejected the directorship of La Scala which was quickly offered him—though he did sign up to conduct the opera company on its first trip to Moscow. "I have engagements until 1970," he said, "so why should I kill myself trying to improve others' standards when they are waiting to take a kick at me for every move I make?"

Such arrogance and independence endears him to his public, who buy out the house whenever

he conducts and wait in line for 24 hours just to get standing room. As a conductor, Karajan has profound musical understanding and an absolute command over the orchestra. He can obtain more with a flick of the wrist than most conductors with the widest gesture. But he leaves nothing to chance. Before a Karajan opera performance, all the staff are at the ready, waiting for "Der Maestro" to carry out his last-minute stage inspection. Assistants try out lighting effects to make sure nothing can go wrong. Even the public gets into their seats 10 minutes before a Karajan performance begins.

Karajan's formula for good music is clear-cut. "Making music sound as it should takes the ability to live through the mind and feelings of the composer you are interpreting. To grasp the artistic value, the conductor has to trace carefully every aspect of the composer's life, his way of thinking, even his handwriting as a composer.

"He has to have the authority to get the results he has in his own mind. For a concert with my Berlin Philharmonic, I first achieve rehearsed perfection—complete mastery of detail and mechanization. Then I let the men play freely during the actual performance, so that they are making the music as much as I am—sharing the emotion which we all have together.

"Above all," says Karajan, "the conductor has to have long experience. A great conductor must live through many bad performances and come out of it without complexes." He himself went through a long and tedious apprenticeship. Born in Salzburg, Herbert at three-and-a-half used to hide under the piano while his older brother Wolfgang played. He practiced alone

till he was four, when, he says, "my family finally let me take lessons. At five I appeared in a school concert playing a rondo of Mozart. I continued playing every year in concerts and was considered an up-and-coming young pianist."

But when he was 18, his Viennese piano teacher said, "Karajan, your imagination of sound can never be fulfilled by two hands. You will never be satisfied with a piano—try to be a conductor."

"And that is how it all began," explains Karajan. "Five of us started our own make-believe orchestra, each playing an instrument and taking turns conducting. During the day we would learn the opera that was on that night at the Vienna Opera. We would go up to the cheapest seats, listen to the performance and hear what mistakes we had made earlier. But at school I only got a chance to conduct the orchestra twice in a whole year. I lost my patience, took all my savings and hired the Salzburg Symphony Orchestra for one evening. It cost me every penny I had, about \$500—but I had to get in front of a proper orchestra."

The director of a small German theater at Ulm was in the audience and engaged Karajan on the spot to conduct his opera season. "The Ulm orchestra had only about 30 musicians," Karajan recalls, "and the stage was as big as a living room. But I knew this was the way to get to know an audience. I stayed for seven years and learned the entire operatic repertory.

"In 1933 the Ulm director told me, 'You have learned everything you can absorb in Ulm—find your way without us because I won't take you back even if you don't find another job.'

"I went to Berlin but found it impossible to break into the closed shop of Furtwängler and Kleiber, Busch and Bruno Walter. I got a





## Beautiful Shape for '65—CHEVY II Look who just turned into the most powerful tightwad in town

Now you can even have a 300-hp V8 in your new 1965 Chevy II. There are new interiors and new styling, too. Chevy II never hid its economy and practicality so well!

Guess what? Quiet, practical little Chevy II just grew fangs.

For the first time ever, you can now ask to have a big 250-hp or 300-hp V8 engine put under the hood of your next Chevy II Sedan or Sport Coupe. The meek just inherited the road.

Standard engines this year are the 195-hp V8 or the 120-hp Six, depending upon the model you choose, along with your choice of a 4-cylinder gas-saver on the Chevy II 100 sedans.

As for the rest of the car, well, it's new in front; new in back; and as you've probably noticed already, the sedans have a sleek new roof line on top.

Inside's new, too. Richer fabrics. Plusher vinyls. Dressed up instrument panel. Scuff-proof cowl side panels. Standard color-keyed seat belts. And you can surround all that with living-room-toned music by adding an AM-FM Stereo radio.

Then of course there's Chevy II economy. No Chevy II story would be complete without a word on *that*! The word is miserly.... Chevrolet Division of General Motors, Detroit, Michigan.





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Only Blackstone Gives You As Many Wanted Features Along With Freedom From Thump and Vibration... thanks to Blackstone's exclusive Gyro-Balance suspension. Gyro-Balance works on the same principle as a child's gyroscope top: automatically smooths out the roughness of unbalanced loads, even as severe as that of a 4' x 6' shag rug. Now, for sure, you never have to return to the washer, once it's started. Gyro-Balance keeps it running through a perfect cycle, without danger of premature shut-off.

#### Check Blackstone's Unshakeable Quality:

- Stainless steel tubs (selected models)
- Pre-set cycles for every type of load
- Porcelain tops and lids • Built-in appearance • Trouble-free mechanical controls
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#### SPECIAL OFFER!

80¢ toy gyroscope top just...

**50¢**

With it your child can demonstrate Blackstone Gyro-Balance... and do dozens of other

fascinating, educational tricks. Carton is doll-house size replica of Blackstone Washer.

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Enclosed is 50¢ in coin (no stamps or C.O.D.'s please) for my Blackstone Gyro-Balance Top. Please send it to:

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**NOW WITH STAINLESS STEEL TUBS!**

## Yoga, yachting and a yen for perfection

### KARAJAN CONTINUED

job accompanying singers for auditions. I was desperate, without food, without an orchestra and completely unwanted—just another young would-be conductor from the provinces.

"One morning the director of the Aachen State Opera called into an agency looking for a young conductor with an established name. I was so desperate that I must have hypnotized him into giving me a chance to conduct one rehearsal.

"I made it and stayed there as musical director, and after a year I became, at 26 years of age, the youngest general manager of an opera house in all Germany."

As was customary, Karajan was invited, together with other young conductors, to direct a guest concert with the Berlin Philharmonic. His performance was brilliant and he was immediately offered a contract by the Berlin State Opera.

There he was caught up in a complicated struggle between the Nazi leaders Goering and Goebbels for control of the opera and all of Berlin's musical life. Karajan brought on himself the enmity of many musical figures and the reputation of being a Nazi sympathizer. This reputation dogged him after the war, kept him out of steady jobs. "But in 1948," he says, "I was completely cleared." Karajan's glorious career really began then.

Karajan has no patience with the weak and asks no quarter for his own mistakes. He is an ambitious man who will stop at nothing

to achieve musical excellence. When doing many operas he has insisted on being not only the conductor but the producer and director as well, responsible for everything.

To Karajan's precision-instrument mentality, "Work is work and pleasure is pleasure and never should the two be confused." A perfectionist in everything, he even times his pleasures to the split second. In the winter he skis on the slopes of St. Moritz for at least two hours daily. For one month each summer he retires to St. Tropez to sail. Every morning, in rain or sunshine, during work or rest periods, he rises at 6 a.m. One hour's fast walk and one hour's yoga are pre-breakfast routine. If he can, he flies his plane from 9 to 10 a.m.

After carefully checking out all his flight instruments, Karajan invariably goes up straight like a fighter pilot. In frivolous moments he hurtles down over his Salzburg bungalow to wake up his wife, and indulges in his favorite maneuver of rapid touch-and-go landings with the rhythm of a Strauss waltz.

"We always know when Herr von Karajan is coming in by the sound of his engine," says an airline worker at the Salzburg airport. "He has the noisiest plane in Austria—it's a high-pitched B-flat jet."

**H**erbert and Eliette, married five years ago in civil ceremony, were wedded secretly by priest last summer in the Tyrol. "Now," said Karajan, "I have her for life and that's what I want."







**From freezer to fun in 8 minutes  
...hotter, fresher, tastier than any pizzeria pizza you bring home.**

Pop up your next party with Chef Boy-Ar-Dee Frozen Pizza. Serve it fresh and bubbling hot ... with the crust so tender and crunchy, and a topping of the Chef's slow-simmered sauce plus *three* kinds of cheese.

It's so much better than a pizzeria pizza that's half-cold by the time you get it home!



And Chef Frozen Pizza has another big advantage: convenience. You keep it in your freezer, pop it into a hot oven—and it's ready, piping hot, in just 8 minutes. Perfect for spur-of-the-moment parties.

Enjoy both kinds: cheese, or sausage with cheese. Delicious!

**Chef Boy-Ar-Dee® Frozen Pizza**





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Comet announces  
an even livelier,  
more beautiful sequel  
to the world's  
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We couldn't make Comet much tougher for 1965, so we made it more beautiful and more lively. The styling is cleaner, sportier, more elegant. The engines are heftier. Every one is bigger—from the thrifty Comet 200 cu.-in. "6" up through the

new 289 cu.-in. Cyclone Super V-8 with 225 horsepower. The Comet ride is new, too. Smoother, solider, quieter. One thing not new

is the durability that made Comet the "World's 100,000-Mile Durability Champion." And you wouldn't want that to change, would you?



*Mercury* **Comet**

the world's 100,000-mile durability champion



# Canadian Lord Calvert is the great Canadian whisky with the funny price.

This is one of the best whiskies ever made in Canada. Yet it's priced at about \$1 less than you'd expect.

Odd. But explainable:

We're bringing Canadian Lord Calvert across the border in barrels and bottling it in the U.S.A.

This way we save enough money in taxes and freight to shave about a dollar off the price of every fifth.

The whisky itself is incomparable. There's never been one like it. We own five great old distilleries in Canada...all the way from British Columbia to Quebec.

And every one of them got in on the act of making Canadian Lord Calvert.

This is a very serious Canadian whisky.  
Only the price is funny.



CANADIAN WHISKY—A BLEND—40 PROOF—IMPORTED BY CALVERT DISTILLERS CO., N.Y.C.

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*U.S. designer again wins top award*

## *Jacques Hits the Jackpot*

The American Fashion Critics' Award, given annually by a jury of editors, is the Oscar of the fashion industry. This fall it was won for the second time by a jaunty French-born designer named Jacques Tiffreau, who at 36 is one of the brightest stars of New York's fashion industry. Trained by the late Christian Dior, Tiffreau combines French finesse with American vitality and good gray flannel (*above*). His clothes are young and unfettered; their cut is deftly simple to stand up to his wild ac-

Trio surrounding designer includes from left: front-buttoned wool flannel evening dress (\$135)

draped with fox; jersey dress with leather sash (\$125); side-wrapped narrow coat (\$200) with fox hood.

cessories, which more often than not are fox. His jackpot collection, shown on these pages, contains the year's hit coat (*right, above*) as well as a spirited new idea for suburban lunches. A fabric innovator, Tiffreau was one of the first to use wool for evening dresses. His specialty this season is zebra-printed velveteen for cocktails. Still struggling with the English language after 12 years, Tiffreau says he likes to design for the girls of his adopted country because "they have such a sophisticated slappiness."



## Overblouses for cocktails and country



Tiffany's zebra-patterned velvet dresses are made of an Italian fabric. All have overblouse tops and easy-to-

walk-in skirts (\$190). They also have matching pants for at-home as well as matching shoes (Herbert Levine).



Bulky overblouses of houndstooth checked wool go over pants cut to fit as snugly as leotards (\$300). In spite of center girl's chilly-looking back, these outfits are intended for outdoor wear.



Overblouse costume (above) with knee-length skirt (\$185) and matching knee socks is newest way to dress for Sunday lunch in the country when all the other ladies are wearing pants.





## Neatest way to split a Grapefruit in half.

No trick at all. But you should see what we had to do at Canada Dry to come up with that Grapefruit Drink.

You know how grapefruit tastes—sassy, some sharp edges, and a little too tart for some folks? We finally found a way to make the flavor behave and still keep the true-fruit goodness. (Look closely at a bottle of Canada Dry Grapefruit and you'll



see tiny bits of fruit). Then, of course, we gave it our own pinpoint carbonation. Result: a deliciously refreshing soft drink with a drier, less-sweet taste than any other you've tried. Proof is that it tastes great whether you're thirsty or not. We bet that once you split a Canada Dry Grapefruit Drink you never will share one again. You'll keep it all to yourself.



This is the 1965 Chrysler. The big one that delivers. Luxury that reflects your good taste, for one thing. A fast answer to your demands, for another.

Look at it. Clean-lined. Big. Beautiful. Eighteen feet of comfort, two tons of security. Easier to get into and out of. Roomy all around.

Get in and drive it. The first thing you'll notice is best described as "scorch." The new Chrysler is a mover. A very, very quick automobile. And there's an improvement in ride you can really feel.



**Announcing the most beautiful Chrysler**

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The interior is striking. The dashboard even has a built-in tissue dispenser, and a coin-sorter for keeping toll money handy.

One more point. A Chrysler isn't all that expensive. Seven models are priced a few dollars a month more than some of the popular smaller cars.

See them all now at your dealers': economical Newport; sports-bred 300 (illus.); and luxurious New Yorker.

Move up to Chrysler. Model 1965.

CHRYSLER DIVISION



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Tune in Bob Hope and The Chrysler Theater, NBC-TV, Fridays,  
and NCAA Football, NBC-TV, Saturday afternoons.



300 4-Door Hardtop

**ever built.**

**Model 1965**

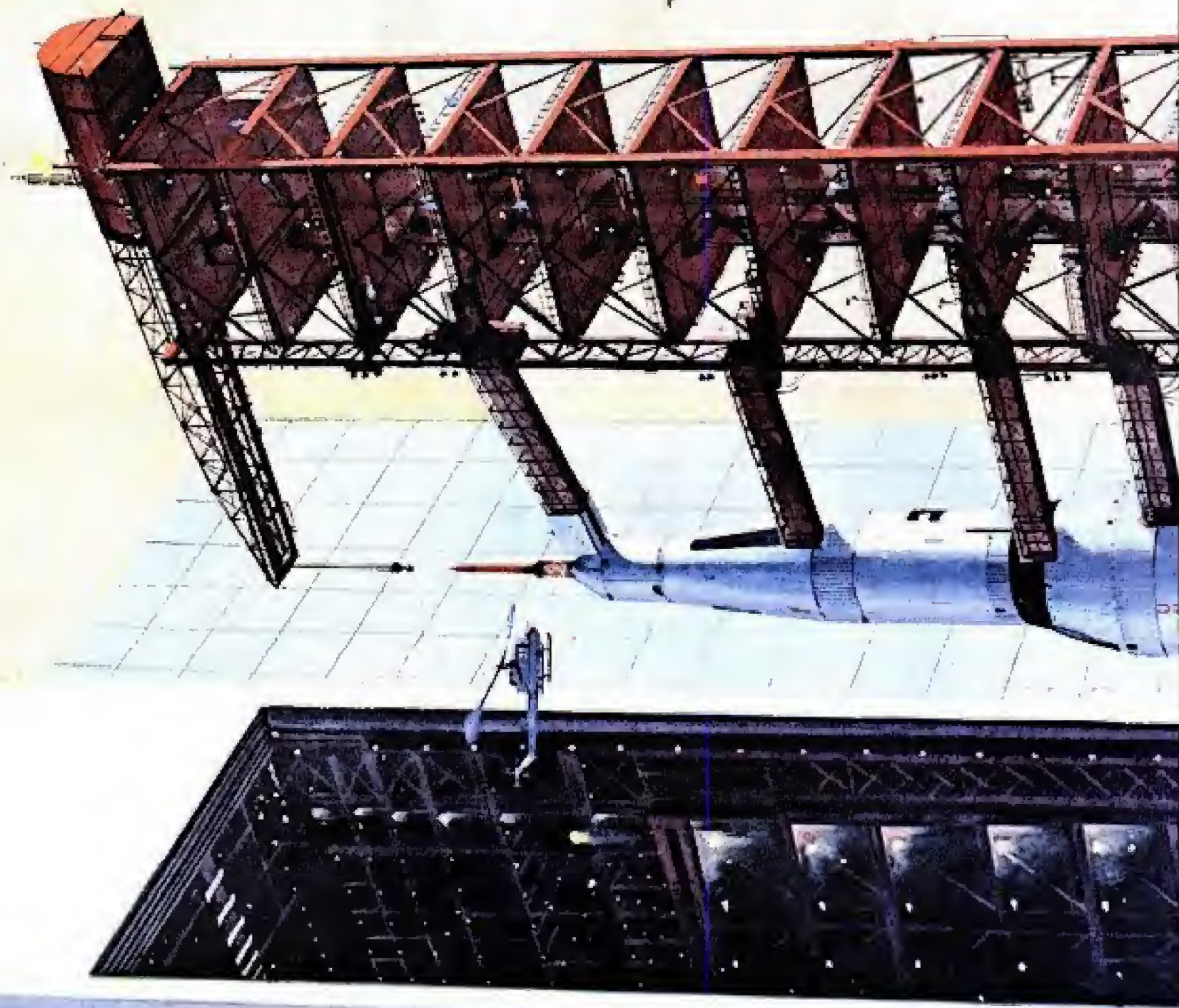
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# WHAT LOOMS AHEAD

**F**or all the spectacular advances already made in space exploration, the frontiers have barely been approached. But some of the machines that will take men to the moon are now being built and others even more advanced are in the planning stages. By 1970 America's Saturn-5 rocket will emerge from its assembly building for the most ungainly leg of its trip to the moon—a one-mile-an-hour crawl to the launching pad. As shown in this painting, everything about the Apollo-Saturn project bespeaks immensity. The hangar (at left) where it is to be assembled will be the largest building in the world, with half again the 77-million-cubic-foot volume of the Pentagon. The rocket itself, two thirds as tall as the 555-foot-high Washington Monument, will be held against a gigantic gantry atop a truck that is half as big as a football field. Once it reaches the pad and is fully loaded, the rocket will weigh as much as a 3,000-ton nuclear sub. Its payload, however, will be less than 500 pounds—the weight of three Astronauts perched atop it in an Apollo spacecraft.

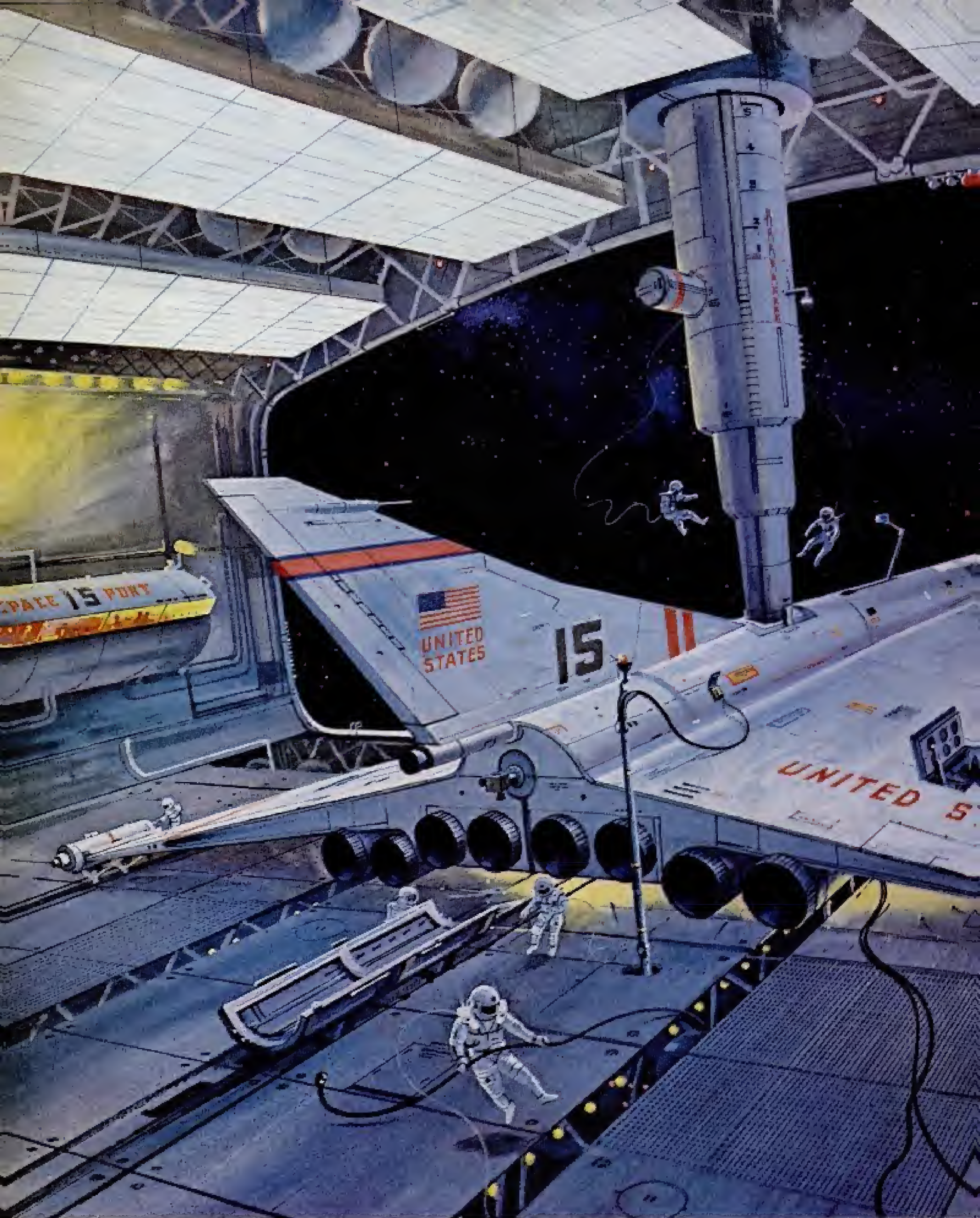
Paintings for LIFE  
by ROBERT MCCALL















## Way-station for men bound for the planets

Just as the air age created the need for air terminals, the age of space travel will require the establishment of manned space stations, and thought is already being given to possible designs. In four decades, space stations—possibly like those shown here—may be in orbit around the earth and serving a variety of purposes. They could be used as weather stations, astronomical observatories, supply points for military space bases, data collection centers for unmanned satellites, even as centers of medical research to investigate the effect of weightlessness on disease. Diplomats reluctant to meet on each other's home ground could travel within minutes to neutral man-made terrain high above the earth and its discords.

But the space station's most practical and perhaps most valuable function will be as a launch platform for interplanetary spacecraft. A hydrogen-fueled shuttle ship like the one seen here could rocket up from the earth, back into the station's hanger and discharge passengers through a telescoping airlock into an overhead waiting room. Men in space suits would swarm around like a ground crew while the vehicle loads up from a fueling tower (right, foreground) and the passengers wait for the connecting flight to Mars.

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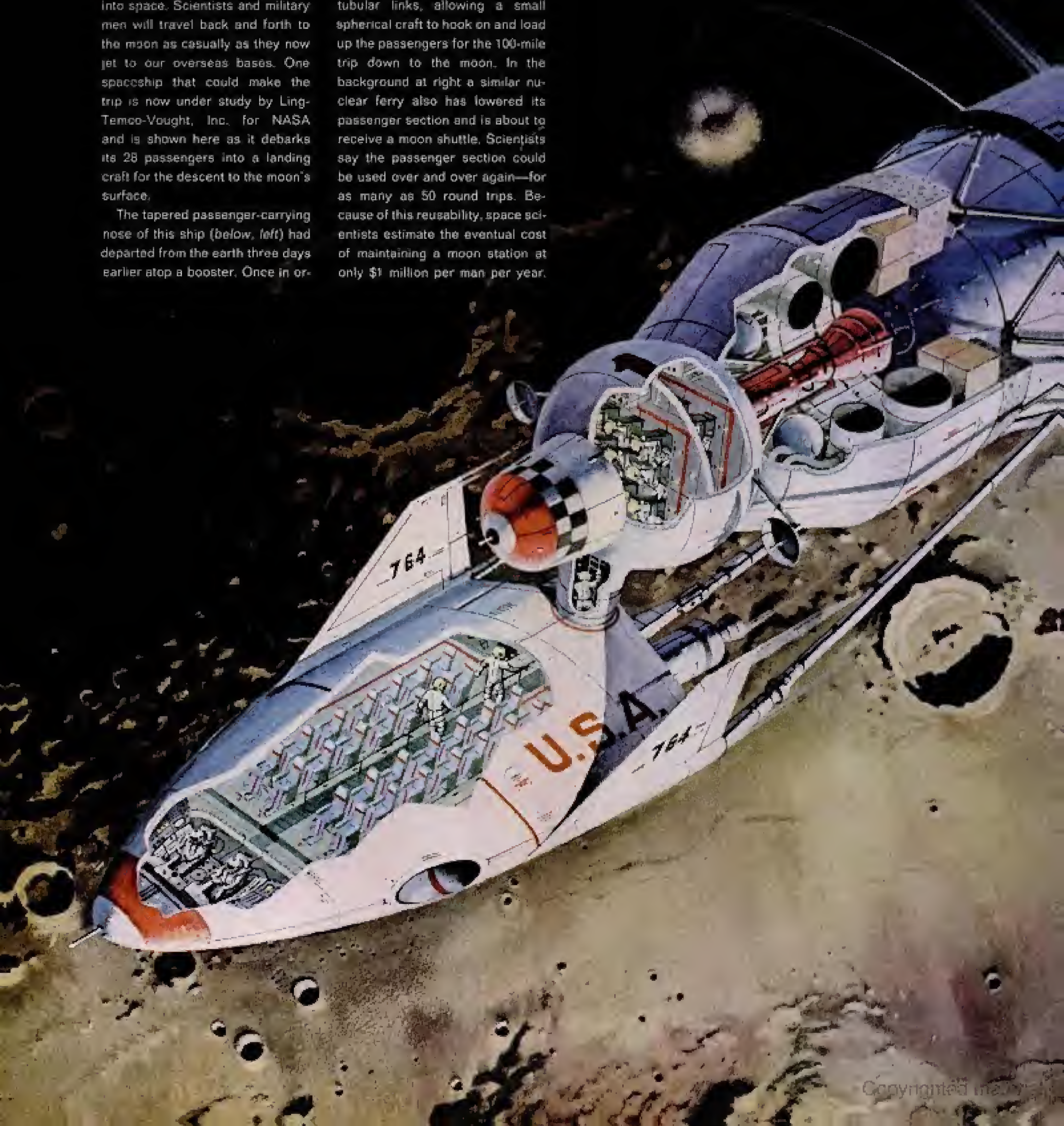
# Mass transportation to the moon

by low-cost  
nuclear ferries

**B**y the end of this century the moon may already be serving as America's first permanent space base. Small lunar outposts will be used for exploration of the moon's surface, for geological prospecting and possibly as launching pads for sending rockets deeper into space. Scientists and military men will travel back and forth to the moon as casually as they now jet to our overseas bases. One spaceship that could make the trip is now under study by Ling-Temco-Vought, Inc. for NASA and is shown here as it debarks its 28 passengers into a landing craft for the descent to the moon's surface.

The tapered passenger-carrying nose of this ship (below, left) had departed from the earth three days earlier atop a booster. Once in or-

bit around the earth, it had then hooked onto a 125-foot-long nuclear-powered ferry (the section carrying the American flag) that carried it to the region of the moon. Having now attained a lunar orbit, the passenger section has swung down 17 feet on long tubular links, allowing a small spherical craft to hook on and load up the passengers for the 100-mile trip down to the moon. In the background at right a similar nuclear ferry also has lowered its passenger section and is about to receive a moon shuttle. Scientists say the passenger section could be used over and over again—for as many as 50 round trips. Because of this reusability, space scientists estimate the eventual cost of maintaining a moon station at only \$1 million per man per year.









## Exploring on Mars, half a year from home

**W**ithin the next few weeks NASA plans to launch two photoreconnaissance vehicles on a trajectory that will take them close to Mars eight months later. Hopefully they will send back data indicating that a manned flight to the planet would be feasible, perhaps within the next two decades.

When and if men do attempt the trip, they may aim for the edge of one of the vast flat desert areas believed to exist on Mars. In this painting the Astronauts—wearing suits designed for a landing on the moon—have established a Mars base camp. They have set up inflatable igloo-shaped shelters (lower left and right) with materials brought in their capsule, and they communicate with earth on radio waves beamed from parabolic antennas. Gas jets strapped to their backs help them get around.

When it is time to leave, the three-man teams will climb back into their arrival vehicle and fire themselves into a Mars orbit where they will rendezvous with a parent ship for the six-month journey back to earth.

Most scientists believe that if life exists on Mars, it is very primitive, perhaps a kind of lichen-like plant. But no one rules out the possibility of surprises. A study made for NASA of possible Mars landing systems by Philco's Aeronutronic Division touches on that possibility: "In the event higher animal forms are encountered, it will be desirable to trap living specimens. They will probably tend to be elusive, however, and photographs or casts of surface imprints may have to suffice."







CONTINUED

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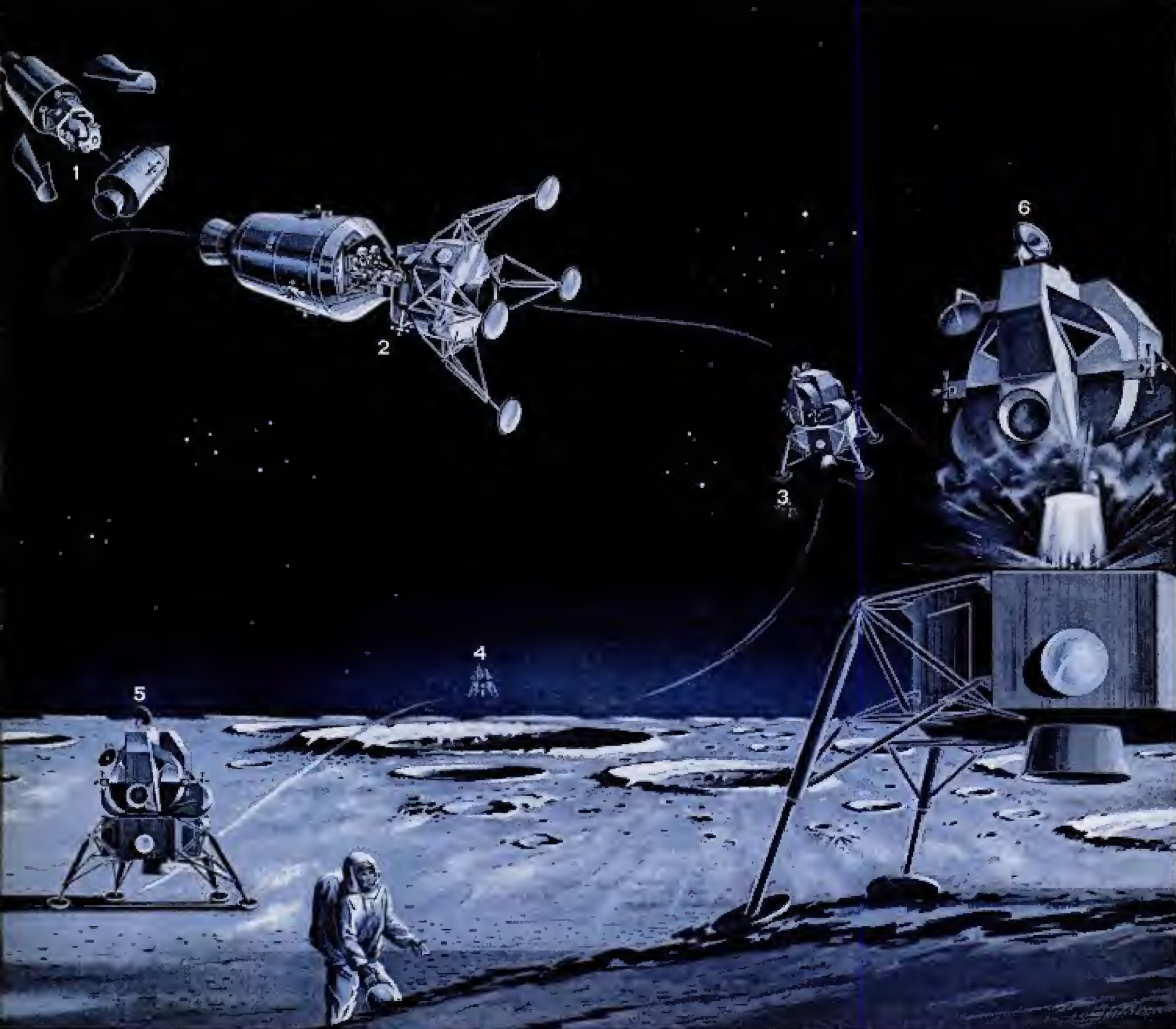




# Ugly, Unearthly Bug

ASTRONAUT PETE CONRAD TELLS  
WHAT IT DOES—SEE NEXT PAGE





This multiple-sequence illustration shows how the LEM will carry out its mission. When the Saturn V rocket's third stage is approaching the moon, panels fall away (1) to expose LEM. The separated Apollo craft, which will function as the mother ship, turns around and docks (2) with LEM. Two Astronauts crawl into LEM which then (3) approaches moon's surface, hovering (4) on downthrust of its engine as its two pilots search for a landing spot. After it has landed (5) the Astronauts take turns exploring outside. Finally LEM takes off (6), leaving four-legged lower section behind, and returns to the mother ship.

#### THE AUTHOR

Astronaut Charles "Pete" Conrad is liaison for development of the lunar excursion module, LEM, the vehicle designed to land men on the moon. An ex-Navy test pilot, Conrad became an Astronaut in 1962.



## 'We'll land it on the moon'

by PETE CONRAD

Sitting there on all fours, it looks like an ugly and unearthly bug—with windows for eyes, a front hatch for a mouth and antennae jutting from its shiny skin. But the ridiculous-looking LEM is man's first true spacecraft: conceived on earth, to be born in space and, when its job is done, left out there to die.

Since it will come alive only in space, the LEM won't have to contend with all the problems of leav-

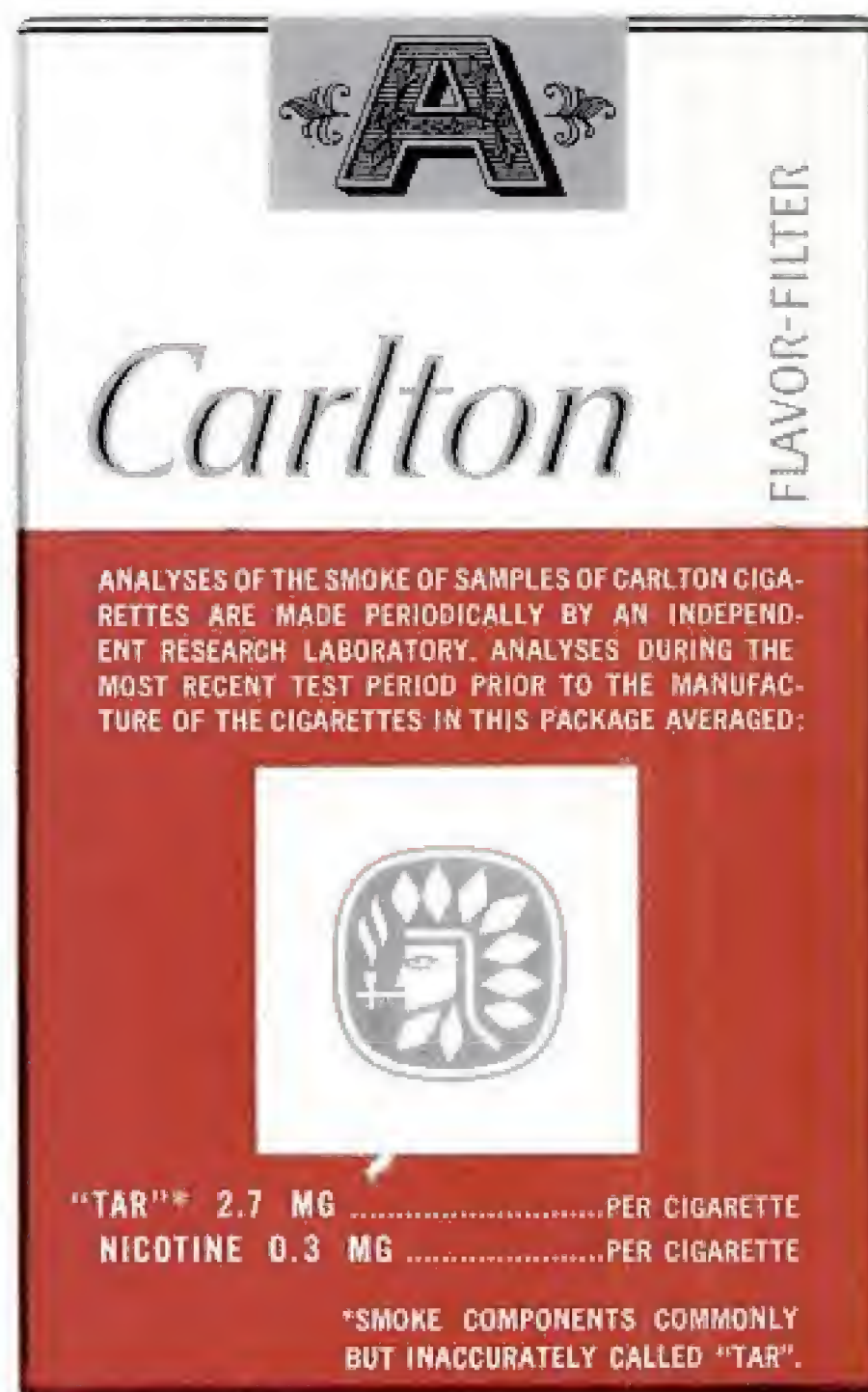
ing or entering the earth's atmosphere. So it doesn't need the sleek, aerodynamic lines we've become accustomed to in airplanes—and even in the Mercury and Gemini spacecraft. The LEM has the innards of a flying machine—but an aerodynamic shell would be useless on the airless moon and therefore has been dispensed with. Each piece of gear has simply been put in the right place to do the right job—*aesthetics be hanged.*

Off the drawing board less than two years, the bug is taking its

CONTINUED

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GENERAL  ELECTRIC

## 'We started with a \$20 billion question'

BUG CONTINUED

strange shape right on schedule. At Long Island's Grumman Aircraft, we've been swarming over and around a 22-foot-high, full-scale mockup made of wood. And now the metal is being cut for the first engineering mockup, a realistic replica—laced with wiring and authentic nuts and bolts—of what's to come in another two years: the first real LEM.

The whole LEM idea is only four years old—and in the beginning it was the subject of a hot debate. NASA had set its sights on going to the moon, but the \$20 billion question was how? There were almost as many proposed answers as there were space enthusiasts.

Basically the first hopes rode on two approaches. One proposal called for boosting men atop a mammoth rocket directly from the earth to the moon's surface. The other proposal called for an extra booster rocket and a spacecraft—each to be separately launched from the earth, then mated in orbit; after that the booster could kick the spacecraft moonward. A third and different concept was finally proposed by John Houbold, a NASA scientist who was engaged in electronically simulating the intricate rendezvous of two vehicles in space.

Houbold's suggestion was to have an Apollo mother ship orbit the moon carrying a lunar ferry—even then they called it a bug—locked to its nose. The bug, which would separate and descend to the moon, would have two stages. The descent stage, with leading struts and a liquid-fuel rocket engine, would take the vehicle to the moon's surface. The ascent stage, at the top, would consist of the cabin carrying two men, and a second liquid-fuel rocket that would power the men in the cabin from the moon's surface back to the mother ship in lunar orbit, about 80 miles out.

In 1962, after the computers and experts had hashed and rehashed the feasibility of each proposal, NASA bought the idea because it would save development time while insuring crew safety.

Actual first-cut design of the LEM was just starting when I came aboard as an Astronaut two years ago. There were countless man hours of bouncing ideas back and forth across the conference table—and always, always there was the worry about weight. The Astronauts' role in all this is not to

design or manage—or even to worry about the physical hazards of a moon flight; that's the job of the space medics (see p. 112). We're there simply to understand every little detail—why it's that way and how it affects us as the spacecraft drivers. To do this we coordinate with the people who have to interface—put together—all the elements. It's not easy when you have two different major contractors, North American building the command module and Grumman the LEM, with one of them in California and the other in New York.

I sit kind of in the middle and see both sides, and worry about little things that may sound silly but which are vital from the driver's standpoint. For example, we want the LEM and the command ship to "feel" as much alike as possible, which means I concern myself with standardizing the lettering and even the color codes on the two instrument panels. Sometimes an outside head can really help the experts. One day I walked cold turkey into a meeting where the engineers were worrying about two electrical switches. If both were turned off by mistake, a vital piece of gear would burn out. I don't know a switching circuit from a hole in the wall, but I made a suggestion: if one switch didn't have an "off" button, there would be no problem. It was that simple. Then, seeing that the rest of the discussion was well over my head, I politely excused myself.

In the early days the ideas and the drawings and the wood were like pieces in a far-out jigsaw puzzle, and their shapes were constantly changing as new ideas were tested. I remember, for example, working on the first cockpit that was laid out. There were four windows and two seats, and the first-cut instrument panel didn't look much like what we've got today.

But as the engineers slowly fitted the pieces together, the LEM has gradually assumed its own buglike personality and the shape of the job ahead is taking form: wood now, metal soon. Before the LEM ever leaves the ground, nine complete models will undergo tests designed to tear them limb from limb—burn them, freeze them, corrupt their electrical nerve centers.

Later, starting in 1966, a half dozen or so manned LEMs will be flown in earth orbit, along with the rest of the Apollo package. Then—we hope by 1970—all our years of

CONTINUED



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## 'Go or no go—10 miles from moon'

BUG CONTINUED

earthbound work will ride one day on a stack of hardware piled 365 feet high.

The stack will have four stages. Three of them belong to the Saturn rocket, a beast with 7.5 million pounds of thrust. Above it, the LEM will sit empty and quiet, its legs folded, sheathed in a casing to protect it from the searing friction as it slices through the earth's atmosphere. At the very top of the stack, dwarfed by the rocket below, will perch the cone-shaped command ship. Inside will be three Astronauts.

When that big firecracker goes off, we'll probably be almost as comfortable as the folks back home. The ride should be as smooth as those taken by the Mercury Astronauts when they launched for their orbital flights. But the similarity ends there. Once in earth orbit, we'll fire up again and head for the moon.

Then, while whistling along at 23,000 miles an hour, we'll perform the first of the ticklish docking maneuvers. We'll shed the LEM's casing and detach the LEM from the top stage of the booster, then separate the command ship, do a U-turn and dock our nose to the LEM's top hatch.

As we slow down into lunar orbit, the LEM will come to life. Two of us will crawl through a 29-inch-wide tunnel into the LEM. We'll activate the LEM's systems, back it away from the command ship, leaving a pilot to drive it in lunar orbit. A short burn of the LEM's descent engine will kick us out of orbit and into a gradual curve toward the moon's surface 80 miles away. As we coast along that curve, the LEM will be riding feet first, its body tilted over on its side.

We'll be checking our systems to make sure they're still "green" and, at the end of the curve, about 10 miles above the lunar surface, will come a big decision. This is the point of no return—"go" or "no go." If a vital piece of gear—say the navigation and guidance system—has conked out, we can still hightail it back to the command ship.

But if everything is "go," we'll burn the descent engine steadily, braking our forward speed and taking us down. At 11,000 feet we'll see the planned landing site through the bottoms of our windows. If Ranger and Surveyor—the unmanned lunar vehicles that are going to blaze our trail—have done

their work, the site ought to look familiar. If not, if there are big boulders or treacherous craters, we can change the site. Two minutes from touchdown we'll have only a couple of minutes of reserve fuel. We'll be almost upright, the engine braking our descent, the LEM's legs extended to meet the moon.

After touchdown, while one man stays behind in the LEM, the other will crawl out through the front hatch into a virgin and hostile world. On this first mission into the unknown he won't wander very far from the LEM. There's still the other half of the problem to worry about—getting back to earth. He probably will stay less than 24 hours. He'll take pictures, make scientific readings and prospect for choice rock samples.

Then, poised on an improvised launching pad formed by the LEM's legs and its burned-out descent stage, we'll conduct our own countdown.

Leaving the descent stage behind us on the moon, we'll light the ascent engine and rejoin the command ship, which is still in orbit around the moon. Here will come another delicate docking maneuver: pinpointing the ship by radar as it comes over the horizon, catching it, then gently locking onto its nose. After that we'll crawl back through the top hatch, jettison the LEM, fire up and head for home.

That LEM's job will be finished, although we'll have actually flown in it no more than an hour. Its fate is not yet certain. It may be left in lunar orbit, or we may decide not to litter the moon's vicinity with orbiting debris. In that case the LEM will be fired back to the moon's surface, a spent hunk of space garbage with a glorious past. Maybe some day we could give it a decent burial on the moon.

**A**ll that is still at least five years away. Meanwhile, still earthbound, I'm living a test pilot's dream: sitting around one day—without a piece of flight hardware in sight—talking and flying the mission in advance over the conference table. The next day I'm "flying" a simulated mission or pitching in physically to help solve a problem.

Take the docking mechanism. We have a device called the Peter Pan which uses cables to counterbalance five-sixths of our weight and thus simulates lunar gravity. I float around in the Peter Pan to find out how long it takes to re-

CONTINUED



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## 'If all fails, we dock by eyeball'

**BUG CONTINUED**

move the docking mechanism from the tunnel we have to crawl through and to see how much energy I crank out while I'm doing it. Afterward I might say: "The docking mechanism worked great, but I got so hot in there I almost had apoplexy." So, after all of us complain about the heat, it's decided that the air-cooled pressure suit we've used all along can't cool the old human machine well enough and the engineers come up with water-cooled underwear.

Look at the visibility problem. All the early LEM proposals started out looking like greenhouses—you could practically see all over the universe from them. To us Astronauts, who had spent half our lives in the clear bubble canopies of fighter planes where 360° visibility is essential, this was fine. But in a spacecraft, the less window area the better, so far as the designers are concerned.

The engineers looked hard at finding exactly what we needed to see. They tried several layouts, including two windows up front and two windows below them that looked down at the moon. But the latest solution is two small, triangular windows that replace the four. At first glance they didn't look as if they would afford a lot of visibility. But because of careful design and positioning they actually increase visibility while reducing window area.

The window solution was related directly to the seating dilemma. In the beginning, I guess, everyone assumed there would be seats in the LEM. Our other spacecraft have them, and there were two in the first LEM cockpit I saw. But in the LEM cabin's close quarters the chairs got in our way when we put on the life-support back-packs we'll wear on the moon.

So Grumman threw out the seats and tried some novel approaches. The engineers were mainly concerned about restraints to ease the jolt at touchdown. The first thing they tried was a rig we jokingly called "the bird cage." A tubular frame attached to a harness was hung from the ceiling and encased us like mummies. Then they tried something that looked like bar stools. They were perched on a cantilever jutting from the front of the cabin. In that little cabin that beam looked like the Brooklyn Bridge—and relatively weighed almost as much. They even looked at bicyclelike seats set atop two

posts stuck in the floor. None quite did the job.

One day when we were kicking the thing around, George Franklin, a NASA engineer working on the LEM, came up with a straightforward solution: just throw out all the seat ideas and ride to the moon standing up. We were all for it. The five-day lunar round trip will be exhausting and we want to conserve our energy. But the LEM ride is a short one. Also, by standing up we could bend forward to get a better view of the moon. And by eliminating chairs we're saving 90 precious pounds.

This does not solve the restraint problem, of course. The first stand-up harness we tried on didn't suit us because it would get in the way as we flew the LEM. The harness was designed for maximum protection at impact. We suggested that the design approach ought to be different from the one for an airplane where, if you're strapped in securely, you may be able to walk away from a bad crash. But if we pile up the LEM hard enough to wreck the ascent stage, we won't be going home again anyway. Engineers are now running tests to find out at what force, short of a complete wreck, we need restraints to protect us from a head banging.

**N**o sooner is one problem solved than another one rears up. Not long ago we decided we did want to put a window in the top of the LEM. With it we felt we could ascend and dock the LEM manually, purely by eyeball, just in case all our guidance systems failed. But there were doubts that we could stand at the controls in a pressurized suit and raise our heads three inches to look through a top window. In a meeting one day I said, "All right, why don't we go to the mockup and find out." The next morning I put on a suit and helmet, got pressurized, grabbed hold of the controls and slowly craned my neck. An inch... two inches... three inches. I looked straight up. Everybody was satisfied and we got our windows.

Of all the problems, the most conspicuous and complex one is the lunar landing itself. When the landing gear was designed last year, no one had a foolproof mental picture of the lunar surface. For example, just about everybody agreed that it's covered with dust, but just how deeply was a subject of controversy. Some scientists believed the dust might be so bad

CONTINUED ON PAGE 99



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Bright Dream....photograph by Monica Casazza

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25 points (1/4 carat)  
\$70 to \$250



50 points (1/2 carat)  
\$180 to \$435



1 carat (100 points)  
\$450 to \$1750



2 carats (200 points)  
\$1100 to \$5600



# CHEVROLET work



*From front to rear of picture: Chevy-Van, Step-Van 7, Series 60 truck with van body, Series 80 diesel tractor, 1/2-ton panel is across the street.*



# Power



## keeps delivery costs low!

Chevrolet Workpower is a delivery truck with a body designed for handling your kind of loads.

And with an engine that keeps cool in tough stop-and-go delivery service and doesn't drink too much gas.

And with a chassis that makes light of heavy cargoes, gives a smooth ride, and keeps repair bills to a minimum. That's Chevrolet Workpower—a delivery truck that fits your job, makes your work easier and, above all, keeps costs low!

The right model for your work is somewhere in Chevy's long strong line for '65. Nowhere else will you see so many covered delivery trucks to choose from. There's the low-cost Chevy-Van—211 cubic feet of load space surrounded by the latest in economy-truck design. For walk-in van users, eleven Step-Van models come ready-made in all sizes. Conventional panels, ½-ton and 1-ton, are available. Also, there are seven different forward control chassis and many chassis-cowl and windshield cowl models to go with whichever special body you require.

You can now get a Chevy that's virtually built to fit your business.

And powered to fit it with economical Chevrolet 4- or 6-cylinder engines or powerful V8's. In addition, Chevy medium-duty models for '65 now offer new lower cost diesels that are ideal for many city delivery operations.

Contact your Chevrolet dealer for whatever you require in a truck. Because Workpower is what he's got this year and that means top-quality hauling equipment in all sizes and shapes from Chevy-Van all the way up to heavyweight tandems. . . . Chevrolet Division of General Motors, Detroit, Michigan.



## THE LONG STRONG LINE FOR '65



**Brach's  
Pure Chocolate**

*Always Fresh* FROM BRACH'S CANDYLAND



Brach's Chocolate Crème Drops



Brach's Chocolate Bridge Mix



Brach's Chocolate Peanuts

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**BRACH'S**

# Fall Chocolate Festival

Our chocolates taste so good you know they're Brach's —fresh from Brach's Candyland! Every piece is made with Brach's own finest, pure chocolate. Enjoy all of Brach's chocolates now during the Brach Fall Chocolate Festival.



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## 'I can feel LEM coming alive'

**BUG** CONTINUED

that the LEM would sink into it and disappear. For final answers we have to wait for unmanned lunar probes like Ranger and Surveyor. Ranger will photograph the moon closeup—as it did so successfully recently. Surveyor will sample the surface, but not until 1966.

In advance of those answers, LEM's engineers had to make some assumptions. From telescopic evidence already on hand, they figured out the most critical possible landing conditions. They ran these through the computer and constructed a mathematical model of the lunar surface. And it's remarkable, from the Ranger VII pictures, just how accurate that model appears to be.

Other engineers had decided on four tanks for the propulsion system, and so four legs made the most structural sense. The legs have big round pads for feet. For shock absorbers the legs contain a material called crushable aluminum honeycomb. It looks like a beehive and fuses on impact. To check out the legs Grumman has dropped small models of the LEM on simulations of every conceivable kind of lunar landscape.

Landing the LEM raises other problems that we're taking one at a time. Hovering over the lunar surface, for example, we expect dust kicked up by our engine exhaust to fool the radar, which measures altitude. We saw the dust problem demonstrated in our helicopter training during practice landings on a big dust pile. We know now

that we'll probably have to rely on the old Mark I eyeball.

But just seeing will be different from here on earth. For one thing, on the moon there won't be houses or trees or any of the usual landmarks we normally use to help judge our altitude and distance. Using a helicopter, Astronauts Elliot Sze and Jim Lovell have simulated moon landings on a large, lunarlike lava flow and found it's tough to spot boulders and craters.

We're also evaluating how best to negotiate the 10-foot drop from the LEM's front hatch to the lunar surface. Working in the Peter Pan rig we have tried ropes, ladders and even a block and tackle. Right now we're using a ladder hooked onto the front landing gear. Climbing back up poses no problem. In lunar gravity a guy like me would weigh only about 25 pounds, and I could easily pull myself up.

Our complex bug keeps growing. And somehow now I can almost feel it coming alive. The cockpit is still made of wood, not aluminum—you knock on the side and it doesn't have the reassuring ring of metal. The instruments are still pieces of paper pasted on. But it's all there, the consoles on three sides, the controls, the funny windows. A few weeks ago the cockpit lighting was installed. Now, when I stand in there alone with just the glow of the instrument lights, I can already imagine myself whistling around the dark side of the moon.

**UNDERWATER TEST.** Wearing a water-filled suit that counters his own buoyancy and gives him zero gravity in a swimming pool, engineer crawls through copper coil simulating passageway between vehicles docked in space.



# BEFORE YOU BUY ANY STEREO, CONSIDER THIS:



This new G-E invention—Porta-Fi—makes your entire house wired for sound. It plays what your G-E console's playing, records or radio, anywhere. Just plug it in.

Starting today, your entire house is wired for sound.

Simply plug the Porta-Fi unit into any electrical outlet in your home. Your G-E stereo console can be equipped with a tiny transmitter which sends hi-fi, or FM or AM radio through regular household wiring. The attractive Porta-Fi speaker picks it up in any room in your home.

And that's not all. Some consoles

have two-way play. Let's say you want to enjoy FM stereo but the kids want to hear records. A flick of a switch gives you Bach on FM in the living room while the kids enjoy their records in the basement, both from the same console at the same time.

Your house is wired for sound. Take advantage of it. Talk to your G-E dealer about Porta-Fi today. Only General Electric has it.

**GENERAL  ELECTRIC**

Audio Products Department, Decatur, Illinois





## All that the 1948 and 1965 Volkswagens have in common

If you think that those 2 Volkswagens are the same, you're making about 5,000 mistakes.

Because that's roughly the number of parts we've changed between 1948 and 1965.

Except for the 4 parts in the picture, the 2 cars are completely different.

You can't see most of the other changes because we

don't work on the looks. We work on the works.

For example, the VW's air-cooled rear engine had its horsepower upped in 1954 and again in 1961.

In 1959, we put 33 teeth on the second gear instead of 32; it made it a touch smoother.

We've changed the oil dipstick 5 times.

We keep making changes in the VW all the time. And





## are these 4 little parts.

we always try to make new parts fit older models, too.

There are 22 changes for 1965 alone.

This year, every window is bigger. There's more leg-room in back. The windshield wipers do a better job. And the brake pedal takes less pressure.

But it still looks very much like the '48 version.

If you owned that '48 VW, you could still get parts for

it at any Volkswagen dealer.

You'd still be driving a car, not an antique.


And it could still bring \$250 or \$300 cold cash.

We don't know how long it takes for a VW to get ready for the junk heap.



But it may be the only car in the world that will get there under its own steam.





Photographed for LIFE  
by FRITZ GORO

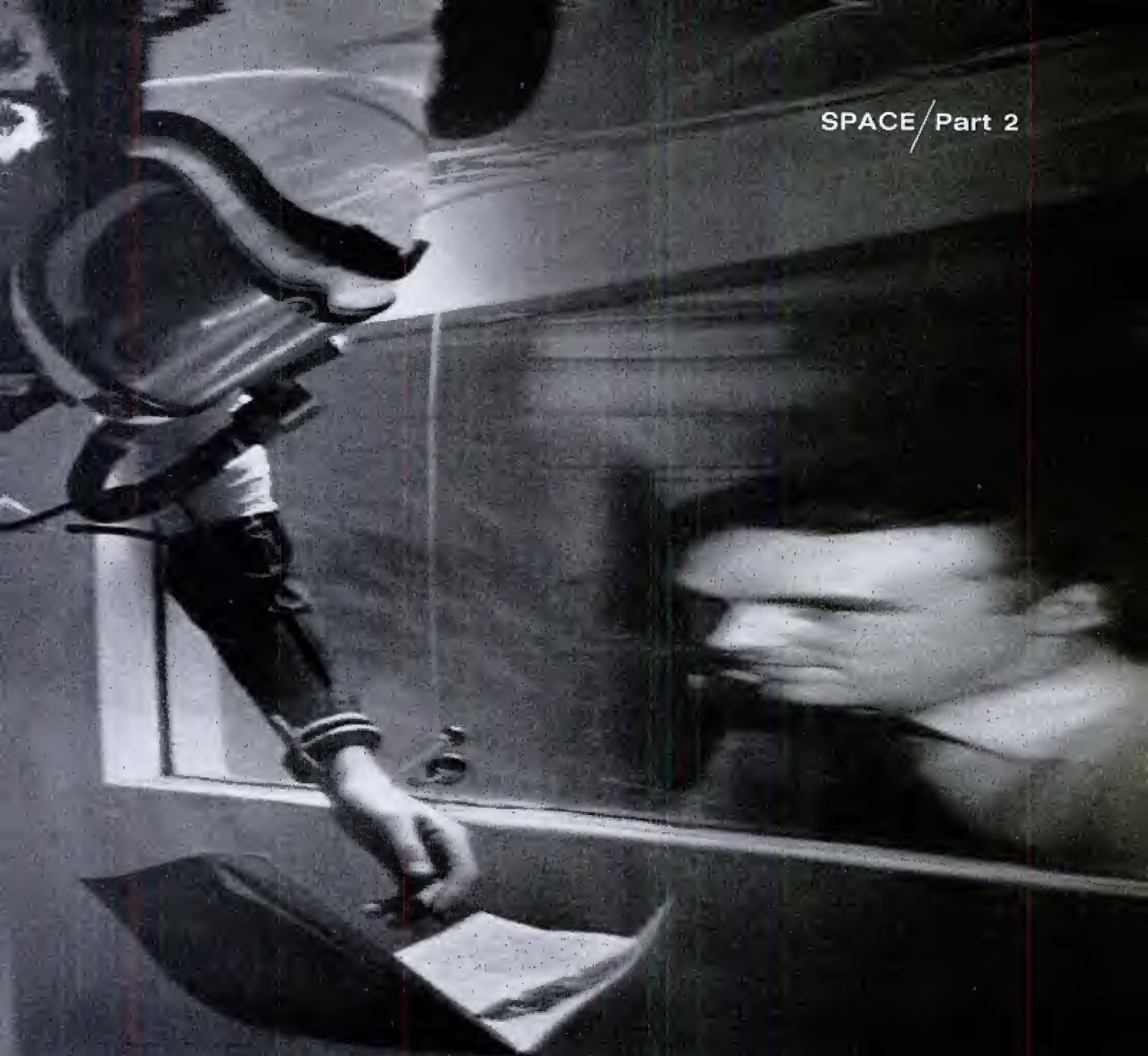
#### TEST IN A TANK

Floating in a water tank to simulate weightlessness, a volunteer reads a free-floating technical report to help pass the time of day. Pressure cuffs on arms and thighs are used to stimulate blood flow. Observer at right is Dr. Duane Graveline of U.S. Air Force.

*A bizarre new science, bioastronautics, prepares us for experiences*

# THE LAST BARRIER





**T**he improbable hardware that will transport man on his celestial adventures is being designed and built. Engineering obstacles are toppling under the onslaught of man's technical ingenuity. The mechanics of space voyages can be calculated with exquisite precision. But there remains a last barrier which lends itself neither to calculation nor precision—the human body. Though man

knows something of the perils that await him in space (see pp. 112-124), he can only guess at how these will affect him. To arrive at a realistic assessment of the hazards and devise ways to head them off, scientists are carrying out experiments that are as fascinating as they are painstaking. Here is a close-up look at what goes on in this new never-never-land science called bioastronautics.

*without precedent*

# IS MAN HIMSELF





### CHIMP WITH A VACUUM HANGOVER

At Holloman Air Force Base, N. Mex., a chimpanzee named Clayton, profusely wired up with electronic monitoring devices, looks weary and wan after a jolting experience: his chamber was rapidly decompressed to a near vacuum. This could happen to an Astronaut if, while traveling through the vacuum of space, his cabin suddenly

sprung a leak or was punctured by a micrometeorite. Scientists want to see how much time the Astronaut would have to take emergency action and live to tell about it. The chimp came through with no lasting ill effects. But this test was not conclusive. It lasted only 8/10ths of a second—hardly time to plug up a leaky space cabin.



### MAN HUNG UP IN A

This man, Air Force Lieutenant Peter Worn, is on the point of blacking out. Wearing sensory gear to record 14 separate and simultaneous reactions, he is hanging immobile to make the blood drain from his head and collect in his legs. This puts tremendous stress on a subject and sometimes he loses consciousness, much as





## FAINTING MACHINE

a soldier does who has stood too long at attention. Despite space successes so far, no one has firmly established the ideal physical standards for space flight. Lieutenant Warn is one of 250 volunteers to undergo a punishing variety of tests in a year-long research program being carried out for NASA at Brooks Air Force Base.



## FROG STRAPPED DOWN FOR EAR TEST

Man's sense of balance is centered in his inner ear, and his success in space may depend upon how well his ear can adjust to weightlessness. Frogs have a mechanism of equilibrium similar to man's, and they are ideal subjects for inner-ear experiments. At NASA's Ames Research Center an electrode, inserted through the roof of the

mouth of a strapped-down and anesthetized bullfrog, measures nerve impulses in response to shifts in the frog's body weight. This test is taking place under normal conditions of gravity. Later the same frog will be similarly tested in a condition of weightlessness aboard a jet training plane flying in great looping arcs.



## MONKEY'S THREE-MONTH IMPRISONMENT TO TEST THE EFFECTS OF PURE OXYGEN

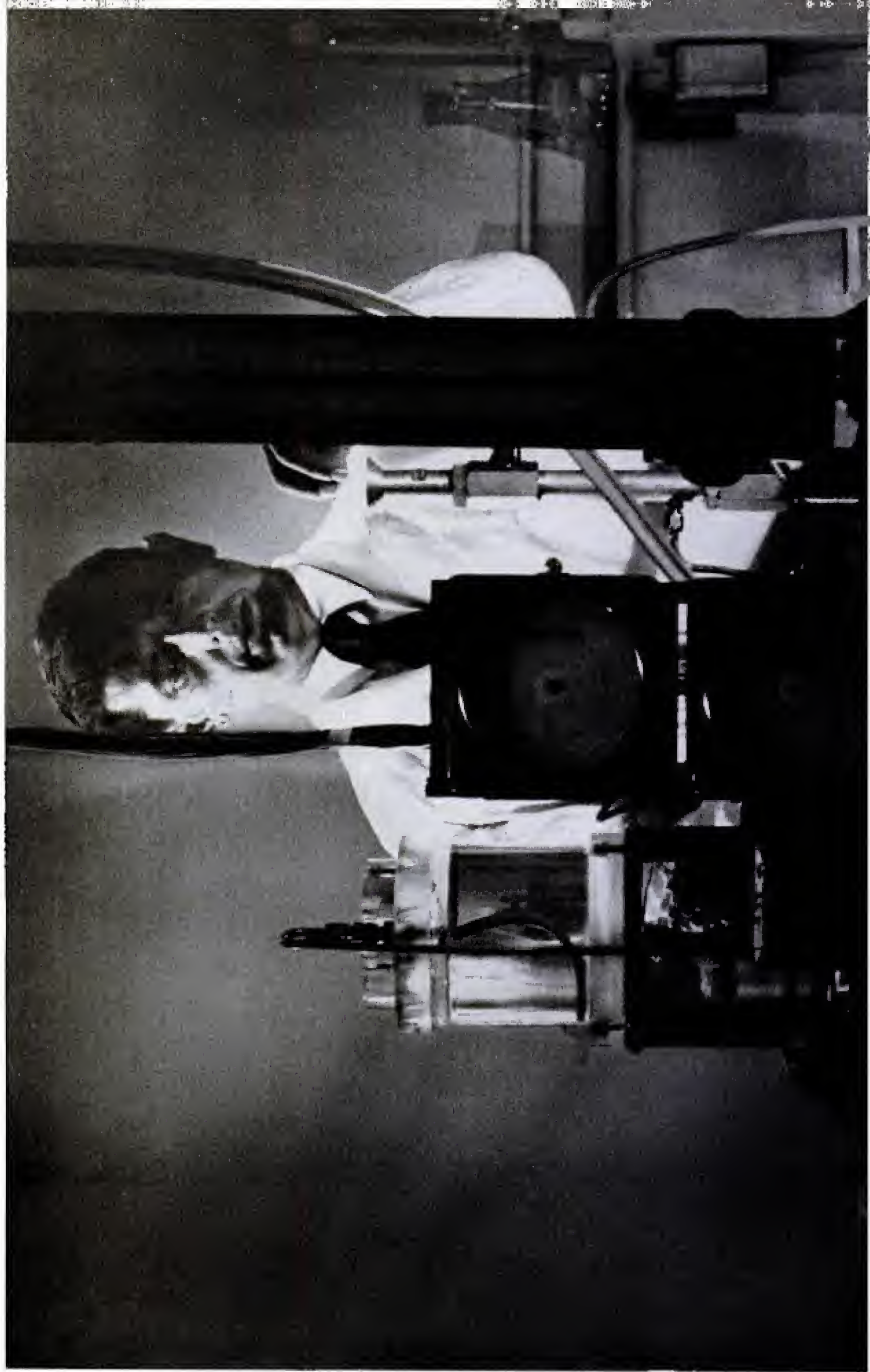
In a test chamber at NASA's Ames Research Center near San Francisco, a macaque monkey named Lizzie stares wistfully through a tangle of instruments that monitor

her biological processes. Not long after this picture was taken, the chamber was sealed, not to be opened again for three months. On all space flights so far, Astro-

nauts have breathed pure oxygen at one third of earth's atmospheric pressure. But scientists are worried about the possible harm pure oxygen might do over long periods

of time. It is Lizzie's mission to help them find out. While she breathes, Dr. Jorge Huertas keeps tabs on her temperature, respiration, blood pressure, heart rate

and brain-wave pattern. Carefully trained for the experiment, Lizzie gets her exercise by working hard for food—80 pulls on a lever for a banana pellet or a squirt of water.









# BEAGLES SNIFF A TRAIL THAT ASTRONAUTS





WILL FOLLOW



### KNEE BENDS TO BRING ON 'BENDS'

Air Force men do calisthenics in a high-altitude chamber to test the extent to which an Astronaut might be susceptible to the bends under certain space-flight conditions. Change-over from nitrogen-oxygen mixture to pure oxygen at reduced pressure made them more susceptible. So did the exercise.

### KENNEL CHECK ON AIR POLLUTION

One problem that may plague space travelers is the build-up of odors and gases given off by the walls and fittings of spacecraft. To test possible toxic effects, these Air Force beagles (left) live in a sealed chamber, breathing pure oxygen mixed with traces of spacecraft construction materials.



### APE'S JUDGMENT VS. SPACE STRESS

Minnie the chimp has racked up a fantastic score (lower right) pulling a lever to indicate which of three constantly changing shapes does not match the other two. To test how space hazards might affect judgment and performance, she will undergo a variety of stresses, then try her skill again.



CONTINUED



# THE FEEL AND THE SOUND OF A FUTURE BLAST-OFF



## TAKING A SPIN IN MANMADE GRAVITY

Weightlessness in space can be counteracted by spinning a spacecraft to create a sort of artificial gravity. Here, using himself as a guinea pig to test effects of centrifugal force that is greater in his feet than in his head, an Air Force cardiologist takes a 24-rpm turn on spin table. In this multiple-exposure photo the circular streaks are tracings of light on which he focuses to keep from getting dizzy.

## RIDING AN UNBORN ROCKET'S ROAR

In a test of the effects of high sound vibration on performance, the airman at right, riding beside a cluster of giant speaker horns on a tilting seat that he controls with a lever, is being blasted with the simulated roar of multimillion-pound-thrust rocket engines of the future. He symbolizes man in the Space Age—called upon to do his job in the face of unearthly onslaughts on his nervous system.







by ALBERT  
ROSENFELD

So many soul-freezing obstacles still stand in the way of manned space travel that they constantly remind us of the firm and unequivocal judgment voiced by Grandma Moses on the occasion of her 100th birthday. "The Lord put us on earth," she said, "and we should stay here until He comes after us." But Dr. Hubertus Strughold of the U.S. Air Force has suggested space travel might seem a less presumptuous aspiration if we remind ourselves that we are already, and always have been, engaged in it. Man, he points out, was born on a spacecraft and so far it has carried him with relative safety through the immensities of the cosmos.

The craft's name, of course, is Earth and, on it, man routinely survives and performs his varied functions while hurtling at break-neck velocities through a vast, essentially inhospitable void; all that separates him from the vacuum of space is the impalpable atmosphere.

Inside this atmosphere man finds comfort, even luxury. It protects him from cosmic radiation and meteorites, and from extremes of heat and cold. It gives him a sheltering environment that includes food and water.

Since man evolved in this environment, his biology is totally dependent upon it. Herein lie both the dilemma of space travel and its possible solution: man must figure out how to take a piece of his environment with him wherever he goes. Though the orbital flights of Astronauts and Cosmonauts to date have taught us much, they have also served to underline how much we still do not know. A formidable array of interlocking problems remains to be solved before we can feel reasonably confident of bringing our Astronauts back unharmed from the first lunar voyage. Disquieting symptoms have been reported by both American and Russian orbiters, and some scientists think that just a little bit of bad luck could have meant disaster. At least one space doctor believes that the wrong kind of cough at a critical moment of re-entry might collapse the chest and make it virtually impossible for the Astronaut to draw another breath.

This opinion is controversial—but so is almost every opinion along this brand new frontier of human inquiry. Those who take a dim view of hurrying man out into space tend to exaggerate the hazards. Those directly engaged in the enterprise tend to minimize them.



To help space medics study the effects of a variety of stresses on human metabolism, this perspiring Air Force volunteer, pedaling furiously on an exercise bike, breathes into an instrument that measures his respiration and analyzes the gases he exhales.

## Pitfalls and perils out there

Meanwhile, we crash ahead under the spirited aegis of NASA, with all our resources committed to a moon landing by 1969, serenely optimistic that, between now and trip time, we will fill in the gaps in our knowledge. Much of this added information will come from a carefully planned series of step-by-step experiments. There will be a number of manned earth-orbital missions in both the Gemini (two-man) and Apollo (three-man) capsules before the Apollo goes on to flights around the moon prior to the actual landing attempt. None of these missions will last longer than 14 days.

Valuable knowledge will also come from the launching of animal-carrying "biosatellites." Finally, much will come from the intensive pursuit by earthbound laboratories of the infant sciences of bioastronautics and space medicine. Because of the urgency imposed by our space timetable and

the unprecedented nature of the program's demands, the acquisition of new knowledge is likely to proceed at an explosive pace. Nowhere will the "spin-off" benefits from the space program be more evident than in the field of medicine.

A classic complaint among doctors has been that they spend all their time learning about sick people, hence understand little about normality. Now studies in space medicine constitute the first massive research ever undertaken of healthy people under almost every variety of stress and circumstance. As a result, we may learn more about the functioning of the normal human body in the next 10 years than we have learned in any century so far.

Anything on the earth's surface, including man, is constantly subjected to a force scientists design-

SPACE / Part 2

nate as 1 G—that is, the gravitational force generated by the earth. Smaller objects generate smaller gravitational forces; for example, gravity on the moon is only 1/6 G. The 1 G force is what holds man on earth and gives him his "weight." In space, man is said to be in a gravity-free state—also known as zero G or weightlessness.

But man is geared to gravity. His circulatory system carries blood in all directions, including up—against gravity—and down, where gravity pulls it. Man maintains his sense of balance and orientation on earth by means of messages sent to the brain by delicate sensors in his inner ear, acting in response to gravity. The very tensions of muscle, bone and joint as he stands erect set up biochemical processes that govern the distribution of calcium and other minerals in his bones. Some scientists are also beginning to suspect that gravity is involved in triggering hormones that help regulate the elimination of body fluids through urination and sweating.

All Astronauts and Cosmonauts seem to have performed pretty well during their relatively brief bouts with zero G, belying the scarier predictions of early pessimists who speculated that man would have heart failure as soon as he went weightless. Just the same, orbital experience to date does not offer great assurance that man will do equally well under prolonged exposure to zero G. After his 17-orbit experience, Cosmonaut Gherman Titov reported "unpleasant feelings, resembling seasickness," especially when he "turned his head sharply or was observing swiftly moving objects." At times, he reported, "it is altogether impossible to say whether you are sitting or lying down, or . . . standing up." Some U.S. scientists speculate that Titov's capsule must have been tumbling in space without his being aware of it, but the Russians blame his symptoms specifically on weightlessness.

All the U.S. Astronauts were somewhat dehydrated after their orbital flights. Most of it was due to excessive sweating, partly because of difficulty in adjusting suit temperatures; but much of it was also due to the passage of inordinate quantities of urine. Gordon Cooper, who was up for the longest period (34 hours), lost eight pounds, mostly in body fluids. When he got out of the capsule, he had a dizzy spell and almost fainted due to "orthostatic hypotension"—a too-rapid pulse and lowered blood pressure because of impaired circulation. It took a day for his cardiovascular system to recover.





## Friendly suggestion

If you, too, are particular about taste, you don't have to wear a button to prove it! Simply smoke Pall Mall. Why? Because Pall Mall's natural mildness means just one thing: smooth, pleasing flavor. Flavor that's *blended in*—over, under, around and through the finest tobaccos money can buy! Smoke a *long* cigarette that's *long* on flavor. Buy Pall Mall Famous Cigarettes. Outstanding—and they are mild!



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Motorola presents  
the New Generation  
of Color Television



# Color/65



Contemporary styling that goes so well with today's furniture designs. Has Motorola's new 23" color tube (23" overall diag. tube meas.; 274 sq. in. picture viewing area).

## New Tube

Motorola's exciting Color/65 picture is rectangular, full, bigger, with a natural shape similar to color movies.

All other color sets commercially produced in America today use a round tube. Their pictures are smaller and rounded off. Look how much picture you lose.

Wouldn't you prefer the full-screen rectangular look in Color TV?

Just compare Color/65 from Motorola with any other color set your dealer has on display. See the difference.



COMPARE THE  
PICTURE AREA

## New Slim Cabinets

The new tube is more compact, making the cabinets trim and slim enough to blend beautifully with other furniture. They fit closer to the wall than ever before possible with large screen Color TV sets. Compare this with the way round tube sets stick out.

New Motorola Color/65 TV sets are available in many fine cabinet designs... including decorator sets designed by Drexel exclusively for Motorola.

When you shop for color TV, take a ruler along.



COMPARE THE  
CABINETS

## Proved Dependability

Color/65 sets use sixteen Motorola patented features that contribute to reliability, dependability, or performance for color or black-and-white reception. All sets have hand-wired chassis, hand and dip soldered for circuit connections of high reliability.

Motorola's full year guarantee covers free exchange or repair of any component proven defective in normal use. Arranged through selling dealer. Labor extra. See Color/65 at your Motorola dealer's.

*Why wait? Get the  
look of tomorrow... right now.  
Don't buy a color set that  
may soon be obsolete.  
Get a Motorola Rectangular.*



Clean, uncluttered lines  
mark the simplicity and beauty  
of this Contemporary styling.



# MOTOROLA

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## Motorola Color/65

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 Algonquin Furniture Mart Inc.  
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 B. F. Goodrich Store, 120 N. River  
 Harrington Appliance  
 1301 New York Ave.  
 High Street Radio, 455 High St.  
 Hoffs TV, 505 New York Ave.  
 Leonard & Co., 901.07 S. River St.  
 Watson TV House  
 11 Downers Place  
**BATAVIA**.....Christad's  
**BENSENVILLE**.....Century TV  
**BENSON**.....Hainke Electric  
**BERYN**  
 Gulo Inc., 8700 W. Oden Ave.  
 R. F. Goodrich Store  
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**BLOOMINGTON**  
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 G.K. Appliance  
**CANTON**  
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**CHAMPAIGN**.....Manny & Martin TV  
**CHICAGO**  
 Bob's Radio & TV  
 3655 W. 106th St.  
 Bruno's Furniture & Appl.  
 2900 N. Central Ave.  
 Car's Furniture Unlimited  
 5133 W. Fullerton  
 C.J.T. Inc., 609 W. North Ave.  
 C.M.A., 4300 S. Ashland  
 Command TV, 5245 N. Harlem  
 C.R. Way Uniques  
 8530 S. Pulaski Rd.  
 Delta Wholesale  
 4140 S. Archer Ave.  
 District Furniture  
 4501 S. Pulaski Ave.  
 Diversify TV, 1225 W. Diversify  
 General TV & Electronics  
 3135 W. 63rd St.  
 R. F. Goodrich Store, 700 E. 87th  
 Guaranteed Electric  
 2872 W. Carmak Rd.  
 Hayll's Ltd. TV Service  
 1369 E. 53rd St.  
 Hess TV, 7045 W. Belmont  
 Higgins's Radio & Appl.  
 7125 W. Higgins  
 Kerosa Automotive & Appl.  
 120 E. 133th St.  
 Kewanna TV, 2025 N. Damen Ave.  
 Martell's TV, Furniture & Supply  
 3215 W. 111th St.  
 Metropolitan Furniture Co.  
 2145 W. Carmak Rd.  
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 4350 N. Milwaukee Ave.  
 Midway Sales & Service  
 6407 S. Pulaski Rd.  
 Modern Furniture  
 2714 W. Carmak Rd.  
 Mueller Bros.  
 1272 Milwaukee Ave.  
 Paul's TV Service  
 6031 W. North Avenue  
 Poplin Time, 5707 N. Clark St.  
 Polk Bros. Inc. —All Stores  
 Proctor's TV & Appliance  
 5826 W. Chicago  
 Sells TV & Furniture  
 1647 W. 51st St.  
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 8847 S. Commercial Ave.  
 Southland TV & Radio Sales & Serv.  
 10930 S. Evans  
 Southside Electronics  
 8110 S. Ashland Ave.  
 Stevens Radio, 8623 Southport  
 Tel-A-Save  
 7331 Forest Preserve Drive  
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 Teen House TV  
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 TV Electronics, 1740 W. 79th St.  
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**FRANKFORD**.....Samsmaier Electric  
**FREEDPORT**.....Moss Radio  
**GALENA**  
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 374 S. Chicago Ave.  
 Fitzgerald Furniture, 101 E. Clinton  
 Ger Radio, 200 E. Cass St.  
 R. F. Goodrich Store  
 452 N. Chicago Ave.  
 Jelen Furniture Mart, 138 E. Cass  
 Lindsay TV, 808 N. Raynor  
 Polk Bros. Inc.  
 Polk John, 113 E. Jefferson  
 Zayre, 100 W. Jackson  
**KANKAKEE**  
 Famous Furniture  
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**KENNESAW**.....Sun's TV  
**LA GRANGE**  
 La Grange TV & Organ Co.  
 Polk Bros. Inc.  
**LA GRANGE PARK** UHF Electronics  
**LA SALLE**  
 LaSalle TV  
 Sun's Repair Shop  
**LIBERTYVILLE**.....Ron's MacReady TV  
**LOCKPORT**  
 Lockport Music Center  
 Norra's TV  
**LOMBARD**.....Kaija's TV & Appliance  
**MARSHMAN**.....Zayre  
**MARYWOOD**.....Har's Radio & TV  
**MELROSE PARK**  
 Gers TV  
 Radio Center  
**MIDLEBURG**.....Rader's TV  
**MILAN**.....Nick's TV  
**MOBILE**  
 Ray Anderson Radio & TV, Inc.  
 McGee TV Service  
 Mitty's Furniture & Appliances  
 2 Stores  
 River Delta TV Service  
**MONMOUTH**.....Mormane Radio  
**MONROVIA**.....Lewson TV  
**MORRIS**.....Morris TV  
**MORTON**.....Grimm Oil Co.  
**MUNDELEIN**.....Arden's Furniture  
**NEW LENOX**.....Lincolney Electronics  
**NILES**.....De George TV  
**OSHTON**  
 C.M.A.  
 Zayre  
**OAK PARK**  
 Village Engineers  
 811 N. Harlem Ave.  
**OTTAWA**.....Don's TV  
**PALMATE**.....C.M.A.  
**PARK RIDGE**  
 Bergstrom Electronics  
**PAXTON**.....Paxton Furniture Store  
**PERIN**  
 Brown Home & Auto Stores  
 Cohen Furniture Co.  
**PEGION**  
 Arma Radio & Television  
 2405-11 S. W. Adams  
 Bell-Nelson Radio Service  
 2433 N. Knoxville Ave.  
 Brown Home & Auto Stores  
 All Stores  
 Cohen Furniture Co.  
 336 S.W. Adams St.  
 Hindert's, 807 S. Western Ave.  
**PERU**  
 Crane's Tire Mart  
 Kurtz Radio  
**PLANO**.....Paxco & Lee  
**POLO**.....Knie Appliance  
**PONTIAC**  
 L. F. Wright Furniture & Appliances  
**PROSPECT HEIGHTS**  
 Raykin Radio  
**RANDOLPH**  
 B. F. Goodrich & Appliance Co.  
**RIVER GROVE**.....Polk Bros. Inc.  
**RIVERSIDE**  
 Cardine TV Electronics  
 Riverside Electric  
**ROCKFORD**  
 Appliance City, Inc.  
 3920 East State  
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 219 S. Main St.  
 R. F. Goodrich Store  
 300 South Winnebago  
 Martin Gustafson, 305-7th St.  
 National Appliance  
 Corner of 7th & 18th Ave.  
 Samuelson Radio & TV  
 1020 W. State St.  
 Wayne Western Auto  
 3100 11th St.  
**ROCK ISLAND**  
 Bobbie's TV & Appliance  
 All 4 Stores  
 Chuck Herford TV &  
 Appliance Sales & Service  
 2 Stores  
 J. & R. Auto Store  
 Niska's Home TV & Appl. Center  
 Zayre, 3950-11th St.  
**ROSELLE**.....Harbinger TV Service  
**ROUND LAKE**  
 Arden's Furniture  
 Wagner's TV  
**SKOKIE**  
 Polk Bros. Inc.  
 Polk Store, 9300 N. Skokie Blvd.  
 Skokie Valley TV, 7935 N. Lincoln

**SOUTH CHICAGO HEIGHTS**  
 Illinois TV & Appliance  
**SOUTH HOLLAND**.....Holland Electric  
**SPERLING**.....Prescott & Sisson  
**SPENCER**.....Goth Radio  
**SYCAMORE**.....Berland's Radio & TV  
**TINLEY PARK**.....Tinley Park TV  
**URSANA**.....Glenn Pearl's TV  
**VILLA PARK**  
 B. F. Goodrich Store  
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**WASHINGTON**.....Scott Hardware  
**WAUKEGAN**  
 De Graaf Bros., 1800 N. Lewis  
 Garden TV, 2730 Grand Ave.  
 B. F. Goodrich Store  
 1819 Glen Road  
 Harmony Haven, 1220 Washington  
 Polk Bros. Inc.  
 Polk Waukegan, 1523 N. Lewis Ave.  
**WEST CHICAGO**.....Simmons TV  
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 6025 E. Highway 120  
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 4440 Broadway  
 Star TV, 510 Park St.  
 Straight's, 720 Broadway  
 Yanner TV, 3201 Broadway  
**GOSHEN**.....East Appliance  
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**HAMMOND**  
 Barab's Inc., 463 State St.  
 Bell Appliance, 4730 Holman Ave.  
 Brilliant TV, 1941-169th St.  
 Community Radio  
 5807 Calumet Ave.  
 B. F. Goodrich Store, 5804 Holman  
 Hooper Furn. & Appl.  
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 Worth Furniture, Inc., 514 State St.  
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## 'Zero gravity is full of booby traps'

### MAN IN SPACE CONTINUED

The Russians Pavel Popovich and Andriyan Nikolayev, who were up for three and four days respectively, did not get back to normal for some seven to 10 days afterward. The Russian scientist who reported these "transient functional reactions" thought they were "largely related to the central nervous system, the cardiovascular system and metabolism." In other words, the entire body was upset.

"The whole field of zero G is full of booby traps," says Dr. William Brewster of the Walter Reed Army Medical Center. "We try very hard to foresee everything that might happen, but we're scared to death we'll overlook some obvious little thing. Take something as simple as sinus drainage. In a gravity-free state, the sinuses won't drain at all. If a man is up for a long time, the sinus accumulation might be considerable. Then, on re-entry, when he suddenly begins taking 8 Gs for a while, all that precipitous drainage might be almost too much for him to handle."

Many of the obstacles to be encountered in space flight—such as confinement in cramped quarters and the stresses of acceleration and deceleration—are familiar because similar ones had to be dealt with in developing aircraft and submarines. But weightlessness is unique to space flight. And it is the hardest problem to study.

There are scientists who feel that many of the difficulties attributed to weightlessness might actually be due to other factors—fatigue, confinement, lack of proper exercise, lowered cabin pressures. "The trouble is," says Dr. Lawrence Lamb of the Air Force School of Aviation Medicine, "it's impossible to prove at this time what weightlessness is or is not responsible for, because there is no way to separate it from the other factors."

No matter how cleverly the experiments on earth are conducted, there is no way to get rid of gravity. We can shake, rattle and centrifuge a man to simulate the buffeting of blastoff and the rigors of re-entry. We can isolate him, deprive him of sensory stimuli, put him under any atmospheric pressure to simulate any altitude. But we cannot render him weightless except for less than a minute at a time by flying an airplane on a special kind of roller-coaster course. So there is no way to know what the long-term effects of zero G will be physiologically—let alone psy-

chologically and emotionally—until man actually undergoes the experience.

Scientists have done the best they can by making careful studies of young, healthy subjects under two semi-weightless sets of conditions: simply resting in bed, or immersed in tanks of water which buoy them up so they float effortlessly for long periods of time. Under both sets of conditions fairly drastic things happen to the body. During water immersion, body fluid is passed in copious amounts, and fluids make up some three-fifths of the body's substance. During bed rest, the fluid contains abnormal quantities of calcium and other vital minerals, most of which come directly from the bone. This means that the very substance of the body's bones is being depleted. If this kept up, it would weaken them, making them more liable to fracture. Some speculate that minerals essential to the body's nervous and electrical processes would be lost.

Apart from the fluid and mineral loss, almost from the start of bed rest or water immersion the muscles and circulatory system begin to deteriorate from disuse. There is no certainty, of course, that the deterioration would continue indefinitely or that, on long space flights, the fluids and minerals would continue to be lost. In fact, scientists tend to believe that the body would probably reach some sort of equilibrium and adapt fairly well to weightlessness. The big worry is that the body will adapt too well, then be in no condition to function normally when it gets back under the influence of gravity. A man who has lain long in bed may feel faint and dizzy as soon as he gets up. A man who has been immersed in water for several days needs all the will power he can muster to get out of his tank even for an hour of tests; every move is an effort and he can hardly wait to crawl back into the tank.

Such problems might become serious indeed on extended flights, such as a months-long round trip to Mars or extended duty in an orbital space station. As a consequence, scientists have been working on ways to prevent the body from adapting too well to weightlessness. They have devised ingenious "pressure cuffs" which can be built into the arms or legs of space suits. The cuffs automatically inflate and deflate periodically,





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## Devices to sicken people on purpose

### MAN IN SPACE CONTINUED

thus artificially controlling the blood pressure and, hopefully, preventing cardiovascular deterioration. A combination of carefully thought-out exercises, drug therapy and devices like pressure cuffs might enable future Gordon Coopers to come back without feeling faint or dizzy. They might also be used to treat cardiovascular patients on earth.

All these considerations barely touch on the complexities of zero G. Dr. W. Ross Adey of UCLA's Institute of Brain Research is concerned about whether or not Astronauts can sleep or dream normally in the weightless condition. "Dreams are very important," says Adey. "People who cannot dream in a normal manner get quite neurotic. We won't know much about the sleep patterns of Astronauts until we take electroencephalogram readings during flight."

There are some who believe prolonged weightlessness will so seriously affect a man's sensory apparatus that his visual and auditory responses will be unreliable and his muscular coordination faulty. Still others emphasize the danger of psychological problems that might arise from zero G conditions. One remembers the chilling moment in E. B. White's celebrated short story, *The Morning of the Day They Did It*, when two Astronauts in a fearsomely armed space station reach a sudden realization:

"Hey, Obie," said Trett, "you want to know something else I don't feel the pull of, besides gravity?"

"What?" asked his companion.

"Conscience," said Trett cheerfully. "I don't feel my conscience pulling me around."

"Neither do I," said Obblington. "I ought to feel some pulls but I don't."

"I also don't feel the pull of duty."

"Check," said Obblington . . .

"You feel like doing a little shooting, Obie?"

"You're rootin' tootin' I feel like shootin'."

"Then what are we waiting for?"

Few serious scientists would prophesy that this sort of aberration will really come to pass. But prolonged weightlessness does pose such a vexing problem that a large body of responsible opinion insists we must somehow provide astronauts with artificial gravity.

Douglas Aircraft engineers have proposed a space station with an on-board centrifuge that would simulate gravity by periodically whirling the astronauts around.

Many scientists believe it will be necessary to keep the entire spacecraft rotating to simulate a constant gravitational force. One trouble with this approach is that the G forces would be unevenly distributed. Just as the rim of a turning wheel moves faster than the hub, so in a rotating spacecraft objects farther from the center of gravity would spin faster, hence take greater G forces, than objects closer to the center. In a spacecraft—say 10 feet in diameter—spinning at 62 rpm, a seated Astronaut might be taking 7 Gs on his feet but only 2.2 Gs at his head at a given time. If this kept up, the effect on him might be worse than no gravity at all.

Quite apart from this problem, there is one overriding medical dilemma inherent in any craft being rotated—the high risk of severe motion sickness from disturbances in the inner ear, especially in the fluid-filled semicircular canals. This problem is now being studied most intensively by Captain Ashton Graybiel at the Naval Aviation Medical Center in Pensacola, Fla. where an elaborate array of rotational devices regularly makes people sick on purpose. Meanwhile, some scientists have suggested fairly outlandish solutions—like draining the ear fluid altogether while a man is in space, then putting it back in when he returns; or replacing the tiny otoliths—the "ear stones," no bigger than grains of sand—with magnetic particles that would control orientation. But Captain Graybiel doubts that such bizarre and risky methods will be required. He is optimistic that, by the time the engineers are ready to impart artificial gravity to spacecraft, the doctors will have "space sickness" under control—perhaps by training men to adapt to rotation, perhaps through the use of drugs. Control of space sickness would be a boon to more than just the Astronaut population; it would mean the control of all forms of motion sickness—on land, at sea, in the air.

For physical examinations on earth, it is deemed sufficient to take a man's blood pressure every now and then, and an occasional electrocardiogram to check his heart. But

CONTINUED





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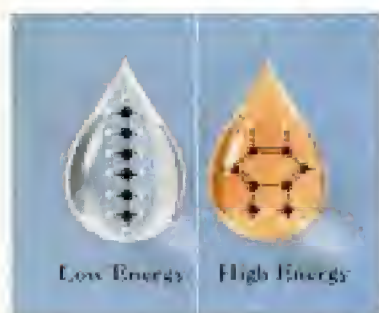
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#### MAN IN SPACE CONTINUED

doctors have to keep much better track of a man when he is living under space-flight conditions. The doctor cannot go along for the ride—at least, not yet; nor is there room to cart along the bulky equipment ordinarily used in the M.D.'s office. The measuring devices must, therefore, be compact and automatic, and the information must be radioed to earth. If the signs become alarming at any point, there must be something the earthbound doctors can do—or build into the system ahead of time. Ideally, the system that space medics envision would report a much greater variety of data than is required of an ordinary office patient—pulse rate and blood pressure, oxygen intake and fluid output, internal and external temperatures, EKG and EEG, to name but a few. And all these data would have to be reported instantaneously, simultaneously and continuously. They would all be fed into a miniaturized computing machine aboard the spacecraft—which meanwhile would also be compiling full information from the capsule's life-support system. Programmed into the computer would be recognition of warning signs when anything began to go wrong and the automatic adjustment of whatever was wrong before the Astronaut himself even knew he was in trouble.

A dream system like this is still a long time away, but medical engineers have already made impressive progress. There are space helmets with built-in EEG electrodes, strap-on heartbeat meters no big-

In multiple-exposure picture taken at Brooks Air Force Base in San Antonio, a giant ball is spun atop cushion of air to see how rotation affects space pilot. The exposure showing the volunteer airman inside was made with the door open before test began.

ger than a dime, blood-pressure measuring devices that can be worn on the finger like a fat ring; a whole arsenal of minuscule gadgetry to measure such things as skin temperature and the salt content of sweat so that doctors (or computers) can be warned instantly of the onset of fear, rage or anxiety. Some items of electronic gear no bigger than a matchbox do more than a roomful of conventional equipment—and do it more reliably and with much greater sensitivity.

Many of these space-medical marvels have already been adapted for day-to-day use and, as the space medics' dream draws nearer, it will mean more and more to everyone's family doctor.

As a matter of fact, medicine having nothing to do with space often is the first to benefit from the new research. For the space medics themselves, progress is painful. Every new scrap of knowledge, every improvement in mechanism and technique must be integrated into intricate life-support systems in the space capsules. And these systems, the scientists have learned to their chagrin, can be full of unsuspected booby traps.

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# 'Space smog' will be a constant hazard

MAN IN SPACE continued

being tested. The test was to have lasted for 30 days, but it had to be called off on the fifth day because the subjects were getting violently ill. One unanticipated problem, it turned out, was that nearly any substance in a space cabin, from the covering on the floor to the paint on the wall to the resin in the wood, might be "outgassing"—that is, evaporating off tiny bits of its substance in the form of gas molecules. This outgassing phenomenon can happen anywhere, any time, but in an ordinary, ventilated room these minute bits of contamination quickly disappear unnoticed. In a tightly closed-off chamber or capsule, however, the contaminants accumulate and, acting together, add up to a poisonous form of air pollution. The problem identified, Boeing overcame it by carefully selecting the materials to be used inside the cabin and taking extraordinary precautions to keep contamination to a minimum. But now "space smog" is recognized as a constant hazard. In long rows of jugs and in chambers at places like North American Aviation, Douglas Aircraft and the Wright-Patterson Air Force Base, every type of material going into our future space capsules is undergoing long-term tests for possibly injurious outgassing.

Actually, no one expects any real trouble on the shorter-range space trips now being planned. But longer ones are bound to be worrisome. It has been estimated that the space cabin in a manned orbital laboratory will contain no less than 600 materials, tiny molecules of which would be floating around in minute but ever-increasing concentrations. But contributing most of all to the space smog will be man himself. Dr. Tom Weber of Beckman Instruments, Inc., has compiled 400 separate substances that man gives off in the normal course of breathing, sweating and the other reactions and responses of mere existence. Of these, the most toxic substances potentially are those given off in elimination—phenol from urine, for example, or methane from feces. And quite apart from the body's normal exudations, there remain many unknowns. For instance, every man is full of all sorts of microbes which he knows little or nothing about. Most of them are benevolent—but would they remain so in space? And who knows what kind of submicroscopic life a man might be harboring to which

he himself is immune but to which his companions in space might not be? The stresses of space will certainly make man more susceptible to infection.

**O**n a long space trip—say, a 12-month round trip to Mars—Astronauts cannot possibly pack along enough food, water and oxygen, even if the supplies were concentrated and packaged in new and ingenious ways. For the life cycle on earth, plants thrive on the carbon dioxide man breathes out, while they give off oxygen for man to breathe. There are chemical compounds, known as superoxides, which can do very much the same thing.

Some of these have been tested quite successfully under simulated conditions. But plants—specifically, algae from the sea—are a key element in the advanced systems with which scientists are now experimenting. In a perfect system, the fast-growing algae would not only live on the Astronaut's expired breath and renew his oxygen supply; the plants would also supply very high-protein food. The algae would be supported by sunlight, watered by his recycled and purified urine (which he would also drink), and perhaps fertilized by his excreted wastes. The concept may constitute quite a wrench to the fastidious, but scientists insist that water recycled from urine can be made purer than anything that comes out of our household taps, and that plants fertilized by humans should be no less edible than those fertilized by animals.

Meanwhile, the Astronauts who make the first round trip to the moon will subsist on ordinary freeze-dried foods, which they will reconstitute with water. They will store all their waste materials on board—chemically treated to kill odors. And they will breathe an atmosphere of pure oxygen.

Pure oxygen has its disadvantages. For one thing, it is a fire hazard. It also speeds up the process of food spoilage. Moreover breathing it at atmospheric pressure (15 pounds per square inch) for more than a very few days is a sure way to commit suicide. The Astronauts will breathe it at five pounds per square inch (one third of atmospheric pressure). At that lowered pressure it is known to be safe for at least 30 days.

The air man breathes on earth is made up roughly of one-fifth oxygen and four-fifths nitrogen.

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## The most baffling unknown of all

### MAN IN SPACE CONTINUED

Everyone knows that man cannot live without the oxygen, but it has always been assumed that the nitrogen, an inert element, is useless to man. Now scientists speculate that nitrogen may have some subtle, hitherto unsuspected value for man—which seems logical enough, since he evolved over the millennia in an atmosphere that is full of it. To be on the safe side, some space doctors advocate mixing nitrogen into the cabin atmosphere.

There is anything but full agreement yet on either the composition or pressure of the atmosphere to be used in space cabins—and all seem to have their built-in problems. We all know, of course, that when deep-sea divers are brought up too quickly, they get the bends, a painful and sometimes fatal reaction caused by nitrogen bubbles in the blood due to the rapid pressure change. So if nitrogen is a component of the cabin atmosphere, Astronauts may run into similar troubles when they shift to another atmosphere at lower pressure. One plan for a manned orbital laboratory, for example, calls for a nitrogen-oxygen atmosphere at 7 pounds per square inch. A man getting into his space suit where he would breathe pure oxygen at 3.5 pounds per square inch would have to keep a sharp look-out for danger signals.

The foregoing by no means constitutes a complete catalog of all the biomedical difficulties to be faced in space. Hazards like vibration, noise and meteorites have not even been mentioned. But the greatest unknown of all is how man will be affected by such an unheard-of combination of stresses. It is not enough for man merely to survive out in space. It is generally agreed that he must feel reasonably comfortable and secure in order to get any fruitful work done. Long-drawn-out physiological distress is certain to have a major influence on his intellectual capacity and emotional well-being, and therefore on his judgment, if not on his very sanity. Will weightlessness and other stresses make him more susceptible to radiation damage? Will the impact of radiation increase the danger of space smog in the cabin?

Each man is a unique biological organism who reacts uniquely to each kind of stress. Tolerance to noise and vibration, for example, is a very individual matter. Rotation that doesn't bother one man

will make another quite sick. Will such differences render it virtually impossible to get together a team of spacemen who will react alike to a variety of critical circumstances? No one will know the answers with any degree of certainty until the day well-equipped orbital stations are in regular operation.

Meanwhile the first Apollo Astronauts do not have time to worry about these long-range complexities. The food they will eat and the atmosphere they will breathe have already been decided on. They will remove their beards with a wind-up shaver that captures all the whisker fuzz, and probably will "brush" their teeth by swishing around in their mouths a foaming dentifrice which they can then swallow. To make them more comfortable with zero G, they will probably do some isometric exercises, and pressure cuffs may be built into their space suits. To give them a feeling of security, they will sleep under a lightweight, all-covering netting. None of these measures offers long-term solutions to the problems of zero G, but most scientists think they will suffice for Project Apollo.

**F**or the Apollo flights, and for all future space travel, there remains yet one more all-pervasive worry: radiation. Space is full of radiation—high-frequency waves like X rays and gamma rays, enormously energetic particles such as electrons, protons and a variety of cosmic rays, any of which, on making a direct hit on an atom or molecule in a human cell, can cause damage. On earth, the atmosphere protects us from most of this radiation. It is the space beyond the atmosphere that concerns space doctors. So far, all manned orbiting has taken place on the bare fringe of space, just above the atmosphere. The highest anyone has gone is 203 miles. At that altitude hazards from radiation—mainly from cosmic rays—have turned out to be minimal. In fact, after the Man High balloon flights in 1957 and 1958, scientists concluded that radiation would be no real problem after all. Then, a few months later, the Explorer satellites discovered the now-notorious Van Allen Belts. These vast seas of deadly radiation, consisting mostly of electrons and protons trapped by the earth's magnetic field, begin several hundred miles out and extend with varying intensity for some 40,000 miles into space.

CONTINUED





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## MAN IN SPACE CONTINUED

Beyond the belts there is still cosmic radiation to contend with—and one additional menace: solar-flare radiation. Violent magnetic storms on the sun periodically spew out torrents of enormously energetic particles. This solar-flare activity appears to be cyclical, coming to its peak about every 11 years. The next peak is due to occur at the end of this decade—just when some of our important lunar missions are scheduled. On this score alone, a good many scientists still think our present timetable is foolhardy and are certain that the moon trips will have to be postponed beyond 1970.

NASA scientists and independent astronomers are working hard on the problem of predicting solar flares more accurately. Until recently many believed it would be certain death for Astronauts to get caught out in a solar storm. But the estimated odds have lately been revised heavily in favor of the Astronauts. On the basis of data radioed back from satellites, NASA planners are now convinced that radiation hazards will not be serious enough to call off any space project currently contemplated, including the moon landing. They insist that cosmic radiation does not shape up as a major menace. The Van Allen Belts, they say, are of course, too hot to linger in—so hot that future space stations will have to orbit either below them or above them—but not especially dangerous to moonbound Astronauts who can speed through them in a few minutes' time. As for solar flares, NASA scientists believe that even if unanticipated eruptions were to occur during an Apollo flight, the Astronauts could still abort their mission and high-tail it for home. Dr. Wright Langham of the Los Alamos Scientific Laboratory believes that exposure to repeated solar-flare bombardment spread out over a period of days does not carry the same biological penalty as the same exposure in an acute dose. On the whole, says Dr. Langham, unless the lunar Astronauts are "awfully unlucky," they ought to make it back all right.

There is no special radiation shielding being built into the Apollo capsule. To provide really radiation-proof shielding would make the cabin impossibly heavy. On the other hand, the walls of the Apollo capsule itself, ingeniously multi-layered to protect against extremes of heat and cold as well as the possible impact of micrometeorites, should provide good protection against radiation as well. Apparatus and supplies are also arranged around the capsule to provide

maximum shielding. And Astronauts caught in a solar flare could get some added protection by turning the most heavily shielded part of the capsule toward the sun.

Just the same, the radiation hazard in all its various forms certainly adds to the high risk of the lunar mission. Accordingly, scientists have lately been concentrating their main attention on perfecting ways to make the body itself resistant to radiation damage. Experiments with animals have shown that lowering the body temperature or slowing down the body's rate of metabolism somehow makes the body's cells less susceptible to radiation damage. Some drugs, too, have shown early promise. Though no one has yet quite figured out the mechanism by which these drugs protect cells against radiation damage, scientists now foresee the development of safe and effective anti-radiation pills and ointments.

The quest for anti-radiation medicines did not, of course, begin with the space age. AEC and Army scientists have been working in this area for a long time. But among those pursuing the anti-radiation pill with great vigor for space purposes is Dr. Toby Freedman of North American Aviation, Inc. Dr. Freedman operates on the general philosophy that, if you can't modify either the spacecraft or the environment, "then there is only one thing to do—modify the man." He strongly advocates looking into all sorts of shadowy areas once considered outside the legitimate province of science.

"In the past," Freedman points out, "individuals have demonstrated extraordinary—some claim, even superhuman—powers to resist pain, cold, fire; to survive under fiercely adverse circumstances—without food, without water,

buried alive. For the first time, science is beginning to investigate such phenomena experimentally and with an open mind.

"The Eskimo and the Bedouin," says Dr. Freedman, "live at temperatures well outside the range of survival for most of us. In the Andes and the Himalayas, people live active lives at 12-14,000 feet, where oxygen is 60 per cent of our usual requirements. Since space travel presents just these problems of pressures and temperatures outside the customary range, the remarkable adaptations of people living in extreme climates are no longer simply curious facts but subjects demanding intensive scientific investigation.

"Tibetan lamas are said to be able to maintain normal skin temperature in subzero cold. Yogis buried alive in India survive on a fraction of normal oxygen consumption. Superstition? Maybe not. Recent experiments with seals show that they can stay under water for nearly half an hour without breathing by undergoing certain drastic systemic changes. The seal's heart rate is sharply slowed, peripheral circulation shut off and the oxygen supply shunted to the organs that need it most—the heart and the brain. Furthermore, it appears that part of this process is under conscious control. If a seal can do it, why not a yogi? And if a yogi, why not an Astronaut?"

For long, potentially boring space trips, Freeman asks, "What better way to pass the time than in a sort of hibernation? Perhaps we can devise techniques that will enable the Astronaut to slow his heart rate, lower his body temperature, reduce peripheral circulation and then curl up like a woodchuck."

Spacecraft designing could be greatly simplified if man were more durable. Dr. Freedman thinks our goal should be what he calls Op-

To assess potential danger of radiation in space, a rabbit's eye is blasted with a proton beam at Lockheed Missiles and Space Company in Palo Alto, Calif.



timan—"a man whose outward appearance is quite normal, but who has been adapted to the oxygen requirements of a Himalayan Sherpa, the heat resistance of a walker-on-coals, who needs less food than a hermit, who has the strength of a Sonny Liston, and runs the mile in 3 minutes flat while solving problems in tensor analysis in his head."

Many scientists go along with this Optiman goal and some are actually doing experiments toward achieving it. Others want to study the possible uses of hypnosis and extrasensory perception in space flight. But going far beyond Optiman or any similar proposal is the concept of the Cyborg (for cybernetic organism).

Cybernetics is the study of the relationship between computing machines and the human nervous system. It deals with the art of handling vast quantities of information, running the data through complex computing systems which then feed back new and useful data. To run an automated oil refinery, for example, data are constantly being absorbed and fed back in order to carry out all the intricate industrial processes involved. There are scientists who now believe that the human body could be run cybernetically—i.e., it could be automated—in a similar fashion, though the job would be much harder. The Cyborg, though cybernetically controlled, would be a human being—if, after radical tampering, he could still be called that.

As originally conceived by Dr. Nathan Kline and Manfred Clynes at the Rockland State Hospital in Orangeburg, N.Y., a Cyborg would

CONTINUED



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## MAN IN SPACE CONTINUED

still look like a man, but an un-earthly one indeed. He would be encased in a skintight suit, needing no pressurization because his lungs would be partially collapsed and the blood in them cooled down, while respiration—and most other bodily processes—would be carried on for him cybernetically by artificial organs and senses, some of them attached to the outside of his body, some of them implanted surgically. His mouth and nose, too, would be sealed over by the suit, because he would not need them to breathe with. Cyborgs would communicate with one another by having the electrical impulses from their vocal cords transmitted by radio. The artificial organs—actually a tiny, complex computer system constantly receiving and feeding back information to regulate the body to its changing environment—would keep a Cyborg's metabolism steady despite radical fluctuations in external temperatures and pressures. The Cyborg could travel in an unsealed cabin through the vacuum of space, walk around on the moon or on Mars protected from heat, cold or radiation by a variety of chemicals and concentrated foods being pumped directly to the stomach or bloodstream. Wastes would be chemically processed to make new food. The tiny bits of totally worthless waste matter would be deposited automatically in a small canister carried on the back.

The Cyborg has a good many detractors—even among the hold-est thinkers in bioastronautics, including men like North American's Dr. Freedman and Dr. Straghold of the Air Force. They believe the Cyborg concept would ultimately prove to be unworkable.

More than that, they find the whole idea of the Cyborg repugnant. Nevertheless, many scientists think the basic approach has value, and NASA, not wanting to leave a path unpursued, has issued a preliminary study and development contract for Cyborg systems to the Hamilton Standard Division of United Aircraft.

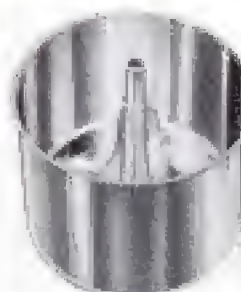
Dr. Michael Del Duca of NASA feels that the Cyborg is only one way to exploit cybernetic possibilities. He believes, for example, that man could use photosynthesis just as plants do, converting sunlight directly into energy; that cybernetic regulation could be accomplished by sophisticated chemicals which would be permeable to the skin, moving wherever they were needed inside or outside the body. Thus man would find space no longer hostile and he could move unencumbered anywhere in the accessible universe.

But whatever the future may bring in the form of Optiman, the Cyborg man or Photosynthetic man, the space engineers of today are stuck with 1964 man, the fragile hothouse flower nurtured in the shelter of earth's atmosphere. It has been said of manned spacecraft that "the only component that spoils the design is the human." Just the same, between now and the end of this decade the engineers and doctors are expected to figure out how to wrap this design-spoiling human in a protective cocoon and get him across 240,000 miles of black and baleful space to the moon and back.

Just before the door is shut for a 15-day simulated orbital flight, two Air Force officers look up from inside their GE capsule. They both came out in feshshape.



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*A Supersonic Campaign Issue Gets off the Ground*

# UP GOES B-70 AT LAST



**W**hile the U.S. space program raced toward its lunar goal and missiles kept rolling off the production lines, a revolutionary aircraft last week made its historic maiden flight in California with escort planes hovering anxiously around. The long-awaited flight of the B-70 (now called the XB-70A) highlighted one of the bitterest controversies of the current presidential campaign. Barry Goldwater, critic of the space race and "unreliable" ICBMs, has castigated the Administration for not

building more manned bombers. North American Aviation's B-70 was to have inaugurated a new family of manned bombers that would carry big nuclear payloads to the earth's far places at speeds faster than a shot bullet. But from the very outset the half-million-pound bomber ran into technical and political troubles. In 1959, the Eisenhower administration drastically cut back the B-70 program. Under McNamara the program was even further curtailed. Only one more B-70 will now be built.

Are two planes worth a whopping investment of some \$1.5 billion? Probably. The B-70's engineers made radical breakthroughs—in heat-resistant materials, tools, welding and cooling techniques, fuels. It has a daring new aerodynamic design that gives the plane 30% more lift by letting it ride on its own supersonic shock waves, much as a speedboat does on ocean waves. All this will pay off handsomely in technical contributions to civilian supersonic transports and possibly to later military aircraft.



**B-70**  
CONTINUED



Because of its strange shape, the B-70 has evoked such descriptions as "the hooded cobra" and "a banana split towing an orange crate." It is so streamlined that Air Force Brig. General Fred J. Ascani said, "It looks like it is doing Mach 3 just sitting on the ground." But its first flight was somewhat disappointing. Because it had troubles with the landing gear and one of its six giant GE turbojet engines, the maiden flight lasted only one hour instead of two. Instead of reaching a planned altitude of 35,000 feet, it got up to only 16,000 feet, and it went only 375 mph instead of 670 to 700 mph—the plane is built to do 2,000 mph at full power. But such troubles are standard on maiden flights.



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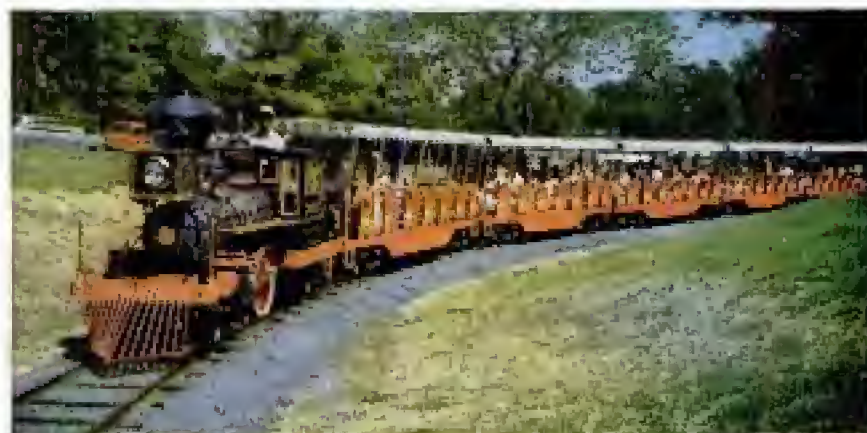
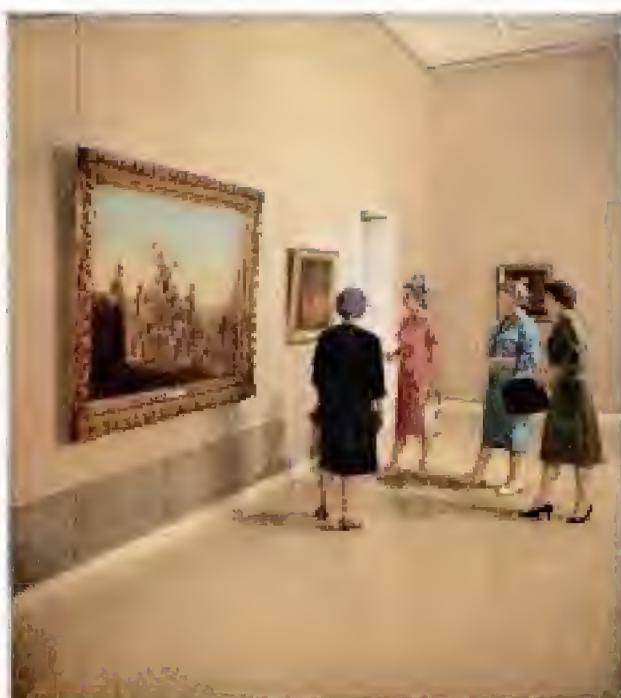
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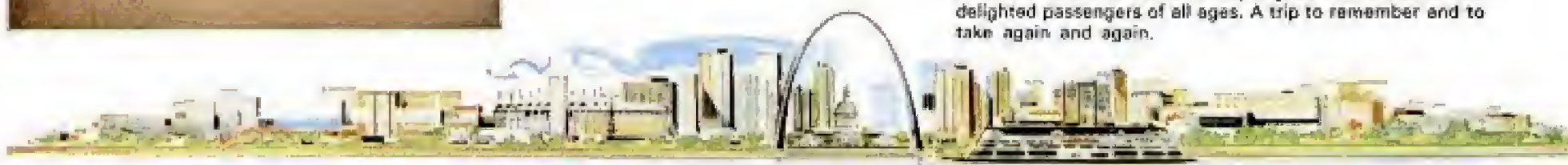
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Plunger-tipped foils make fencing safe for small musketeers

# SQUEAK! YOU GOT ME

As epic sword battles go, this one was a real squeaker. On a rampart of Heldeberg Castle, D'Artagnan had been challenged by Lady de Winter. What else could a fellow do but dispatch that treacherous lady with one rubbery thrust? Then came the lady's friends seeking vengeance—but the gay young blade foiled them all.

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**D**etermined duelist Heidi Harlow, 11, sneers defiance but is surprised and put out of action. She learned to fence as part of the Schenectady school system's recreation program.

**O**n castle steps, Kurt Weinheimer gives *coup de grâce* to Teddy Benson by downing him with stab to the bulb. Foils come in standard 33-inch length and 20-inch length for tinier fencers.





Adopting the Fairbanks stance, Kurt holds off an enemy with his foot and then stands triumphant (below) over the playfield of honor littered with his victims.



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Wilfings  
County Rd. 9008

#### MUNSTER

Brant Construction  
Co., Inc.  
World's Fair Home  
1445 MacArthur  
George E. Watson, P. E.  
George E. Watson,  
Designer-Builder, Inc.  
9206 Foliage

#### NORTH JUDSON

Cast-Stone Industries, Inc.  
1 1/2 Mile W. on Hwy. #10

#### GARY

Consolidated Builders Co.  
1611 W. 54th Ave.

### MICHIGAN

#### BATTLE CREEK

Troxel Construction Co.  
250 Eaton St.

#### ESCANABA

J. W. Pascoe  
Home Builder  
2136—24th Ave., S.

### GRAND RAPIDS

Albert & Leavitt  
Building Co.  
2727 Hampshire Blvd.,  
S.E.

R. D. Brooks, Inc.  
4050 Baywood Dr., S.E.

#### HARVEY

Mr. J. W. Pascoe  
Home Builder  
Churchay Twp.

#### KALAMAZOO

Texan Ranch Homes  
Anthony W. Avery,  
Builder  
Lot #27, Texas Acres  
Q. Ave., W.  
Texas Twp.

Wayne A. De Does  
2607 Pine Ridge Rd.

#### NEGAUNEE

J. W. Pascoe, Home  
Builder  
Owasia St.

#### WATERSMEET

Thornton Construction  
Co.  
Forestry Rd.

### MINNESOTA

#### COON RAPIDS

Dalberg Builders, Inc.  
10720 Mississippi Blvd.,  
N.W.

#### MINNEAPOLIS (EDINA)

Carl Hansen Co.  
5720 View Lane

#### MINNEAPOLIS

Hipp Construction Co.  
7900 28th Ave., N.  
John E. Anderson  
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#### MINNETONKA

Minnetonka Edgewater  
Apt.  
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Homes, Inc.  
Spring Park Lake  
Minnetonka

### NEBRASKA

#### LINCOLN

Trend Homes  
Trendwood & Meadow  
Lane

#### OMAHA

Kruse, Inc.  
50th & Hartman Ave.  
Trend Homes  
13204 Trendwood Dr.

### WISCONSIN

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McClone Construction &  
Supply Co., Inc.  
1600 N. Hall  
Victor Timm  
General Contractor  
49 S. Meadows Dr.

### BEAVER DAM

Wayne K. Ebert  
McKinley St.

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Advance Home Builders,  
Inc.  
1854 Arrowhead Dr.  
Amwood Homes, Inc.  
Corner of Master Ave.  
& Staborn Dr.

#### COBB

Cobb Lumber Co.  
Moundview Dr.

#### FOND DU LAC

Clarence Hermann,  
Gen. Contractor  
144 Arvey Lane  
Sterling Custom Homes  
Corp.  
Lot 4, Royal Ave.

#### GALESVILLE

Paul Fidika  
Rt. #2

#### LUXEMBURG

Van's Lumber & Hardware  
Dyckesville

#### MADISON

Mike Simon, Builder  
4606 Regent St.  
Monona Grove  
Construction Co., Inc.  
1119 Nichols Rd.

#### MARINETTE

Wickstrom Building Co.  
Riverside Ave.

#### MASON

M. Schraufnagel &  
Sons, Inc.

#### MILWAUKEE

Potrykus Brothers  
Builders  
3850 S. Massachusetts  
Ave.

#### RANDOLPH

Randolph Lumber &  
Supply Co., Inc.  
Tamarack St.

#### RIO CREEK

Van's Lumber & Hardware  
Rio Creek

#### SUPERIOR

Campbell Lumber &  
Supply Co.  
Billings Dr.

#### WAUNAKEE

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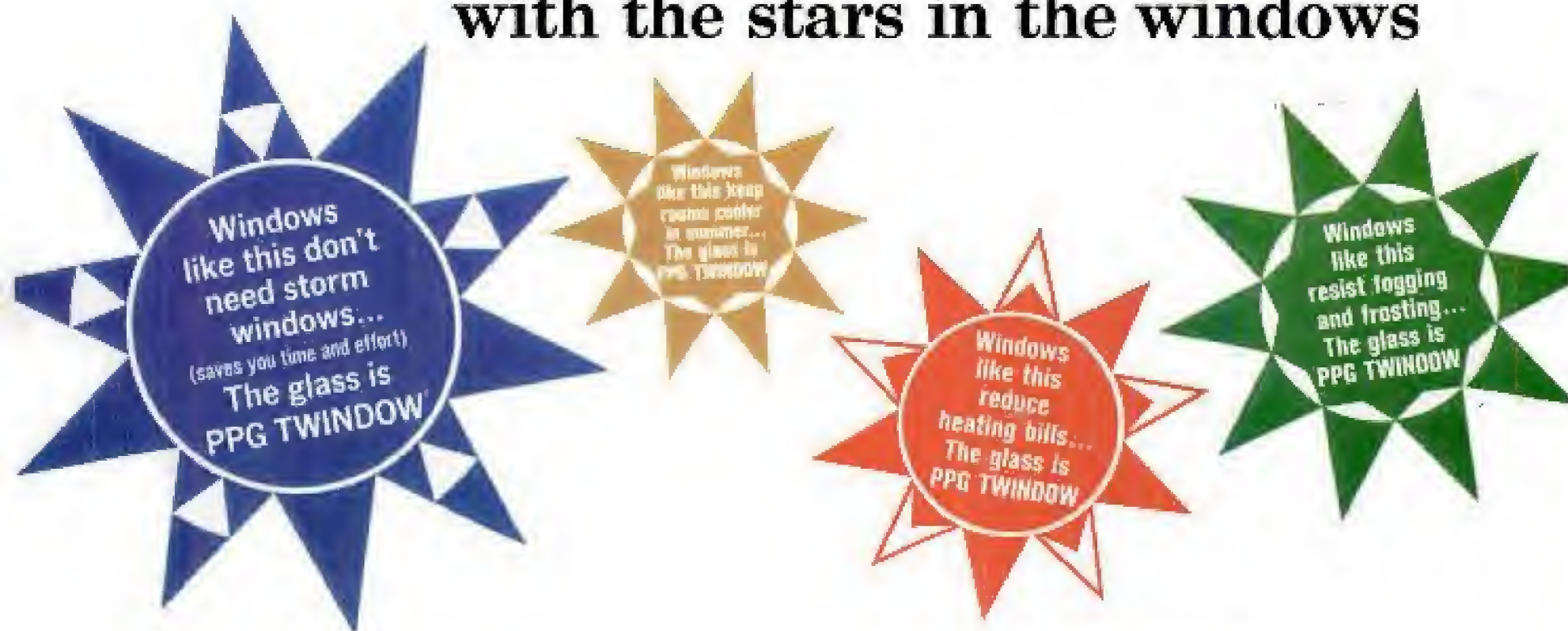






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## Look for the model homes with the stars in the windows



PPG makes the glass that makes the difference  
Pittsburgh Plate Glass Company, Pittsburgh, Pa.





HOLLYWOOD'S STARLET MACHINE CRANKS UP

*End of the*





# Great Girl Drought



It looks, in Hollywood, as if there is going to be a break in the Great Girl Drought. Big studios are intensively scouting photographers models and little-theater actresses—and putting up contract money to bring their finds along. This historic process produced the generation of Turners and Hayworths, of Monroes and Novaks. Then, probably because movies became so expensive that producers were afraid to gamble on newcomers, the girl crop dwindled and only a rare Ann-Margret or a Carol Lynley popped up. This year, with healthy box offices giving them money to spend, studios are in the starlet business again. On these pages are five being staked on a journey to stardom.



MIA FARROW

## JOCELYN LANE

Universal noticed Jocelyn hurrying by in a bit part in an Italian film. She is 24, was born in Vienna and raised in London. "I like to play light, sophisticated parts," she says. But her studio sees her in a different light and she will make her American film debut in the famous old Maria Montez exotic role in a remake of *Ali Baba*.

Mia, daughter of Actress Maureen O'Sullivan and the late director John Farrow, made her debut at 4 as a mushroom in a school play. Last year, she got a small Broadway part in *The Importance of Being Earnest* and Fox signed her. "I'm a kaleidoscope," Mia says, "a thousand different colors, a thousand different moods."





### GILA GOLAN

Gila, who took this name for the movies, does not know her real name—or her age, her birthplace, or her parents. She knows only that as a baby she was plucked from rubble in bomb-torn Krakow, Poland. She grew up in a kibbutz in Israel and fought her way to New York where modeling earned her a contract with Columbia.

### RAQUEL WELCH

When she was 7, Raquel vowed to be a star. She won every beauty contest worth winning in San Diego, then took her explosive looks to Hollywood where she won three film bits and a major role in a minor picture now being made. She has her agent play tennis daily with her at the Beverly Hills Hotel so producers can see her.



### ROSEMARY FORSYTH

Rosemary, who has a Katherine Hepburn-like regalness, was plucked out of a magazine by Universal, then sent to New York for 18 months to act in TV, summer

stock, anywhere she could find seasoning jobs. When she returned to Hollywood, she was seasoned enough to win a role as James Stewart's daughter in *Shenandoah*.







# Chesterfield People:

They like a mild smoke, but just don't like filters. (How about you?)



Joan Nielsen McHale, society editor, Florida



Guy Stillman, breeder of Arabian horses, Arizona



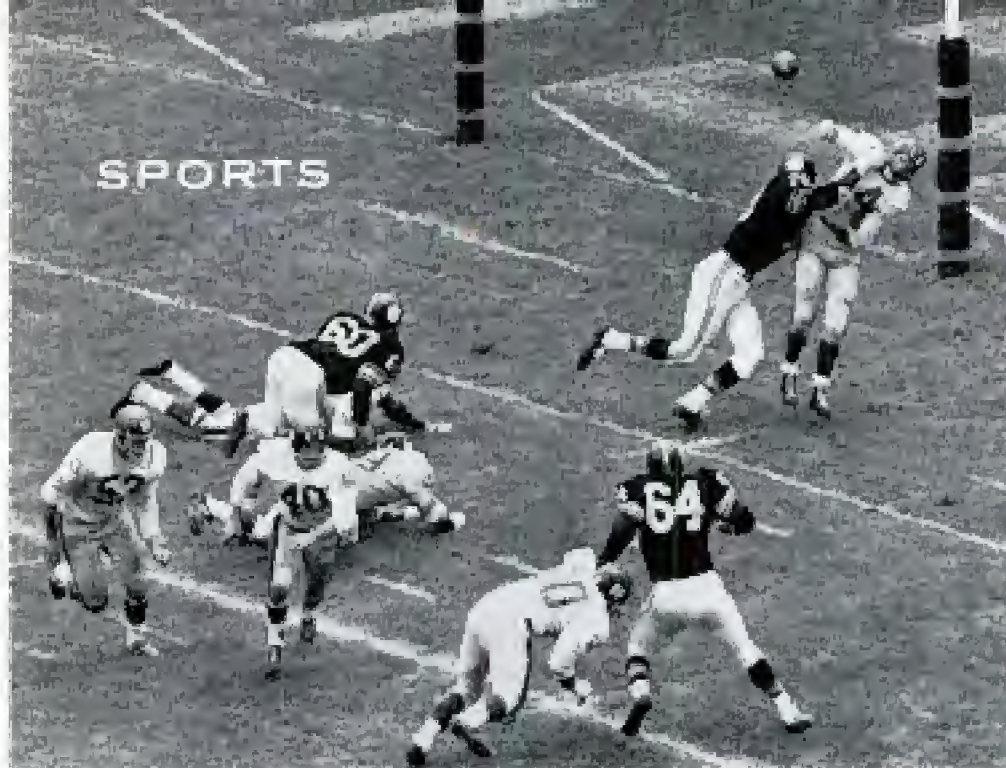
Patrick T. Philbin, insurance evaluator, New York

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# SPORTS



## How They Racked Up the Great Tittle



**T**he lumps and bumps they suffer in a game are what pro football quarterbacks get paid for. But it looked in Pitt Stadium last week as if Y. A. Tittle of the New York Giants ought to put in for a big raise.

In the game against the Pittsburgh Steelers, he had dropped back to pass from his three-yard line (*top left*) when his defense disintegrated and 270-pound End John Baker slammed into him (*above*). Tittle lay alongside Baker like a broken doll (*top right*) as Steeler Tackle Chuck Hinton intercepted his pass for a touchdown.

Tittle's worried teammates clustered around the old pro. His helmet had been ripped off, his face was cut open by the stunning force of the tackle and he couldn't get up. He was finally helped off the field, and his demoralized team, last season's divisional champs, lost their second game in a row.

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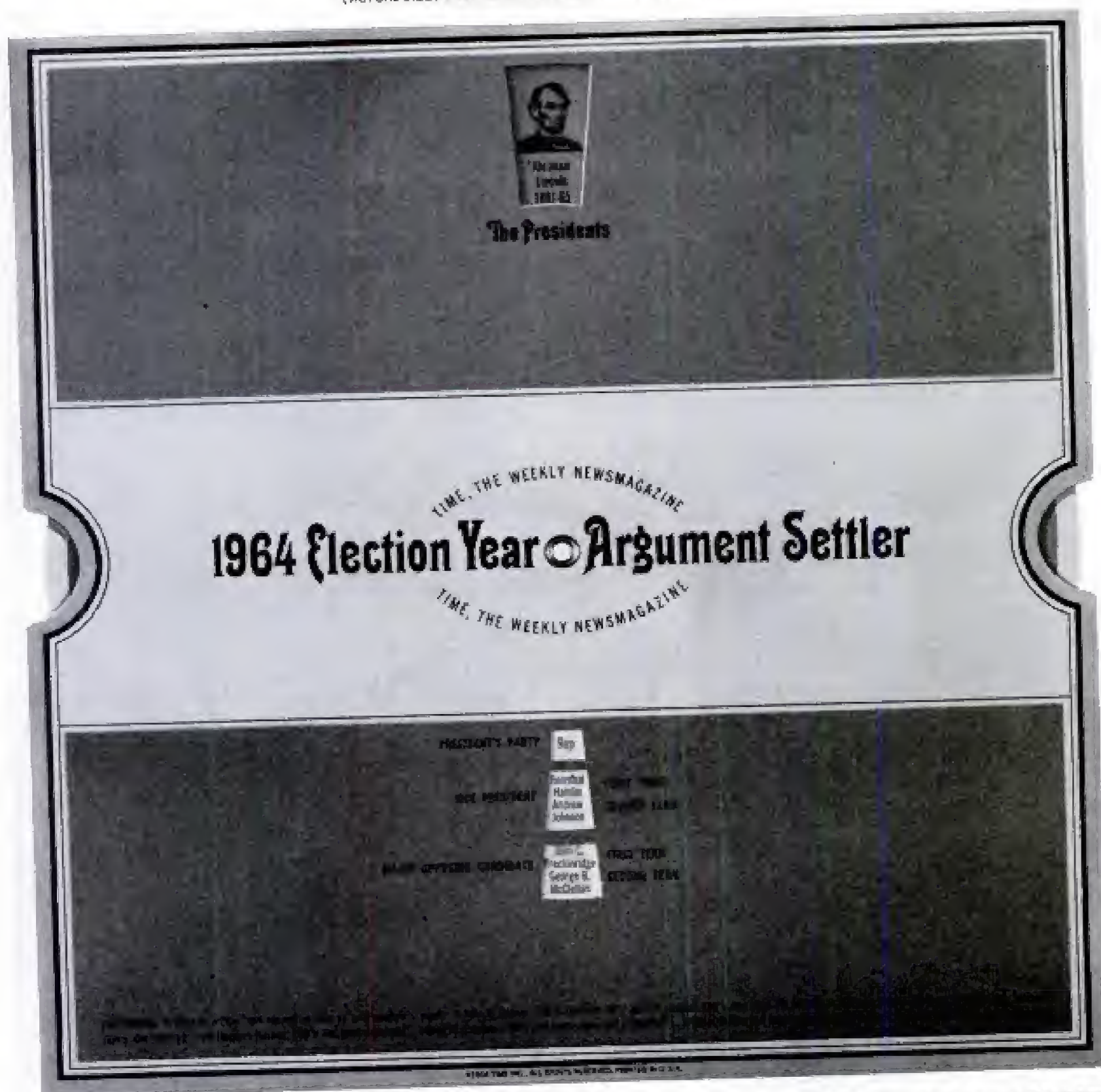


**D**azed and bleeding, Tittle kneels in the end zone before players reach him. A 14-year veteran of the Nation-

al Football League, the 37-year-old quarterback last year led the league in passing. Two days after the game

at Pittsburgh he was back throwing passes at practice with his ribs taped up, insisting he was ready to play.





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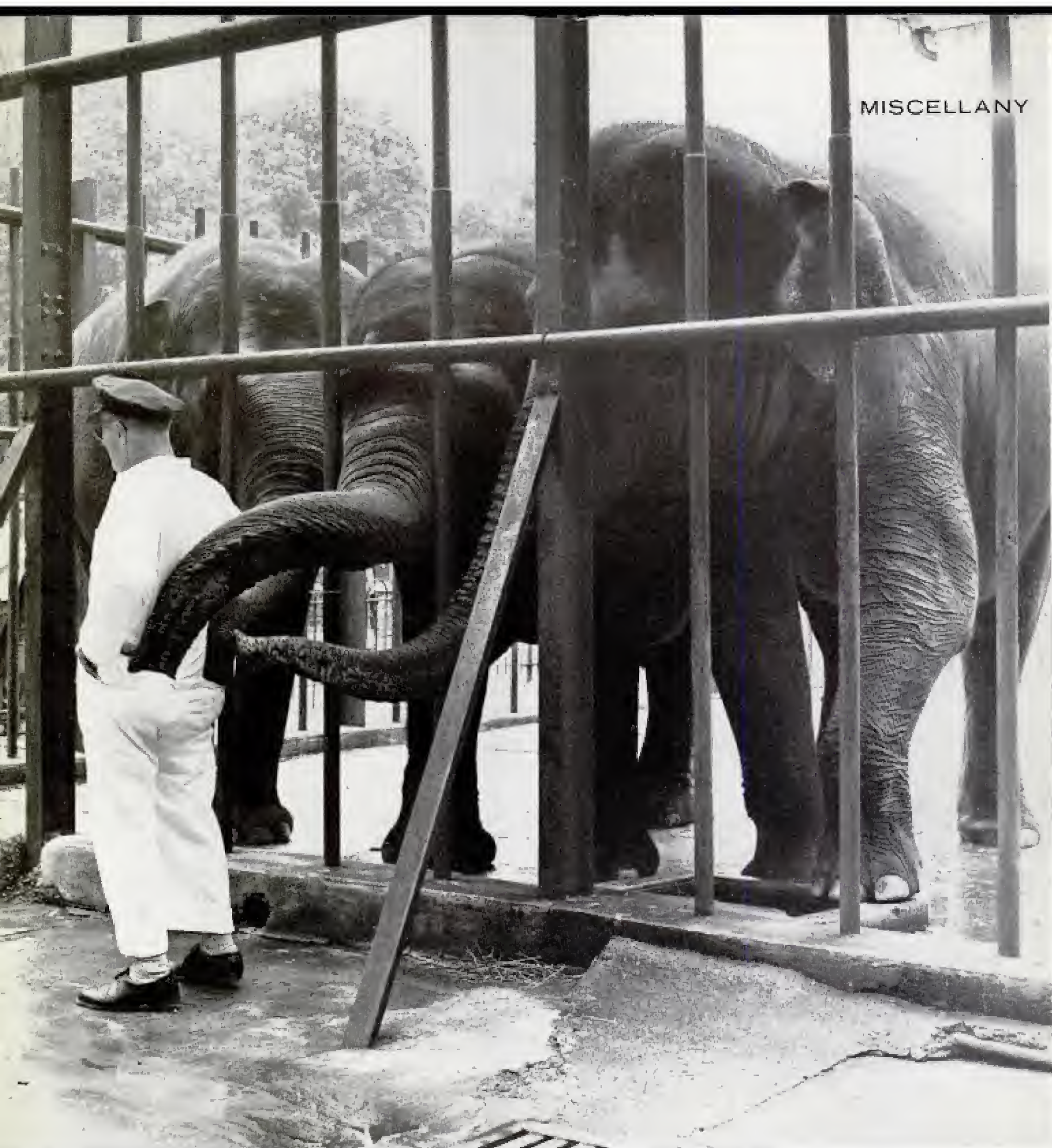
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## PACHYDERM PICKPOCKETS

Do you remember how, when the circus came to town, there was always some local lame-brain whose idea of an elephant joke was to feed one a cigaret instead of a peanut? Of course there was the devil to pay, because elephants and tobacco as a rule do not mix. At the Baltimore Zoo, however, there is a keeper named Clarence Taylor who has persuaded three

lady elephants to lay prejudice aside and share the pleasure he takes in tobacco, the chawin' kind. If anything, they like it even more than he does. They don't just chew the stuff—they gulp it right down. Whenever Taylor wanders near their compound, the three pachyderms go to work like a team of pickpockets to find where the keeper keeps his plug.





## Halfway across the gaping chasm panic held me motionless

**1** "As I swung out between the two towers of rock, all my bravado left me," writes David Pugmire, American friend of Canadian Club. "Gaily, I had accepted a chal-

lenge from an Italian friend to try a perilous traverse in the Dolomite Alps. He assured me that the rope seldom broke. But 1200 feet up, his joke didn't seem funny.



**2** "Hand over hand I pulled myself across. But then I glanced down and fear gripped me. I froze to the rope. The guide urged me on. Finally, with my last ounce of courage, I forced myself forward.



**3** "Safely across. I still had to make the dizzying descent. What a relief as the guide lowered me to the ground. Never again.

**4** "Back at a hotel in Misurina, my Italian friend offered me a drink of his favorite whisky and mine—Canadian Club." Why this whisky's universal popularity? It has the lightness of Scotch *and* the smooth satisfaction of Bourbon. No other whisky tastes quite like it. You can stay with it all evening long—in short ones before dinner, in tall ones after. Enjoy Canadian Club—the world's lightest whisky—tonight.



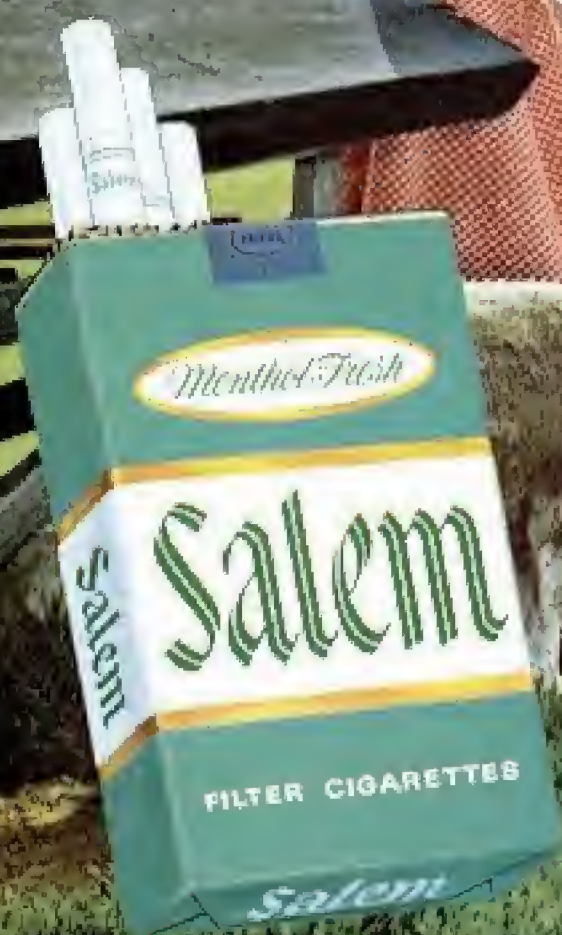
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